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COMPUTERWORLD

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DEC seen attacking VMS fault

BY CHARLES BABCOCK
CW STAFF

Digital Equipment Corp. will try to address the Achilles' heel of its VAX operating system — its transaction processing capability — by upgrading VMS to drive multiple processors.

VMS Version 5.0 is expected to be available for general release in early 1988, according to analysts at market research firms International Data Corp. and The Yankee Group.

Running out

- Inability of Vaxcluster to handle high transaction volume cited by Reebok in switch to IBM 3090. Page 4.

One major DEC client, a financial institution in New York, last week confirmed that VMS Version 5.0 will include a multiprocessor capability referred to as symmetrical multiprocessing. The customer, who requested anonymity, said he had seen Ver-

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Spreadsheet battle lines drawn

Microsoft lobs Excel at 1-2-3; Lotus counters with Macintosh strategy

BY DOUGLAS BARNEY
CW STAFF

NEW YORK — No longer content to go their separate ways, the two giants in the microcomputer software industry last week squared off in a much-anticipated battle for the hearts and pocketbooks of the corporate spreadsheet user.

Microsoft Corp. announced a version of Excel, its graphics-oriented spreadsheet package, for IBM Personal Computer ATs and compatibles. A day earlier, Lotus Development Corp. tried to steal some of Microsoft's thunder by revealing it is developing a version of 1-2-3 for Apple Computer, Inc.'s Macintosh.

Already available for the Macintosh — it has dominated the Mac spreadsheet market — Excel is the first integrated spreadsheet program that takes advantage of the Microsoft Windows graphical user interface. Microsoft is currently pushing the $495 product as the new standard for Intel Corp. 80286 and 80386 hardware platforms and said it does not expect to make major inroads into the extremely large 1-2-3 installed base.

While many users said they are unwilling to switch from 1-2-3 because of training and compatibility issues, both Arthur An-

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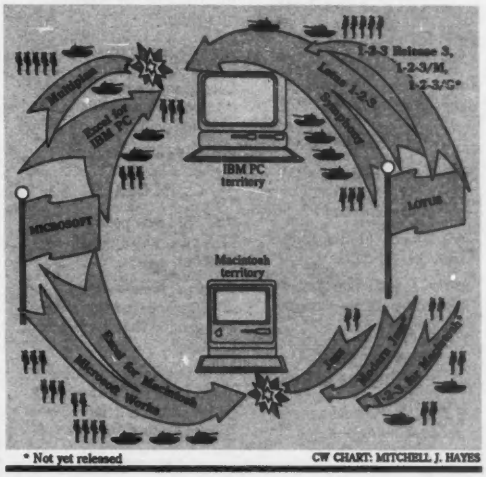
Order of battle

Microsoft and Lotus advance on each other's strongholds, where each has suffered previous disappointments



* Not yet released

CW CHART: MITCHELL J. HAYES

AT&T to unveil critical element of ISDN scheme

BY ELISABETH HORWITT
CW STAFF

BASKING RIDGE, N.J. — AT&T will announce before year's end the first ISDN Primary Rate service to be offered by a major U.S. carrier, the company told *Computerworld* last week. The service could finally provide corporate MIS managers with the practical Integrated Services Digital Network applications they need to justify the potentially heavy cost of implementing the standard, industry sources claimed.

The Primary Rate service allows customer networking devices to consolidate up to 23 64K bit/sec. channels onto a single T1 line to the nearest carrier switching site. From there, the channels can be either routed together to another customer site or fanned out to different destinations over a broad variety of AT&T digital services.

A key feature of the AT&T service will be the ability for users to allocate channels dynamically to different AT&T services on a call-by-call basis, according to AT&T ISDN staff manager Peter Gagnon.

TRW, Inc. plans to "aggressively use the Primary Rate service as soon as it becomes available to us" as a way to "switch any given channel from one service to another as users' requirements change," said Kenneth Jankowski, the company's network services manager. ISDN makes this possible by setting up an interactive communications link between customer-premise equipment and carrier switching systems.

Less is more

TRW, which now uses the full range of AT&T digital services, including Accunet, Megacom and Software Defined Network, looks forward to saving on access charges by "consolidating our communications requirements over a Primary Rate Interface," Jankowski added.

The introduction of the ISDN equivalent of high-speed T1 links could accelerate user acceptance of ISDN, "which depends on large corporations who

Continued on page 153

HP stitches rivals into enhanced net

BY ELISABETH HORWITT
CW STAFF

CUPERTINO, Calif. — Hewlett-Packard Co. announced a salvo of networking products last week that increases users' abilities to partition applications across multiple HP minicomputers and to integrate IBM and Digital Equipment Corp. computers into the network, HP claimed.

Key offerings include software tools to distribute applications across an HP 3000 and a personal computer and software allowing users to initiate sessions on remote HP and DEC hosts.

HP also announced support for IBM's Netbios and future support of IBM's Token-Ring network as well as the PU2.1 peer-to-peer protocol.

HP announced two communications software packages designed to enhance communications between IBM PCs and HP 3000 minicomputers. Network Interprocess Communications/

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Spreadsheet wars. Lotus announces 1-2-3 for the Mac and its intent to position 1-2-3 as the spreadsheet standard, but it will face battle from Microsoft's Excel, currently among the most popular Mac applications. Page 8.

New system. The IBM PC community is abuzz with anticipation of a replacement for the System/36, predicted to offer a 30% improvement in price/performance over the current system. Page 4.

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Quotable

"Every product you get, a year later, it's a commodity."

LAWRENCE SCHOENBERG
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SPOTLIGHT

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NEWS

4381+9370=9371?

IBM may fuse two product lines into one

BY JAMES CONNOLLY
CW STAFF

NEW YORK — IBM plans to replace its 4381 superminicomputers and 9370 departmental processor with a single product line covering a performance range from the low-end 9370 to the heart of the company's 3090 mainframe family.

That report was included in a series of predictions offered last week by International Data Corp. (IDC) as the Framingham, Mass.-based market research firm analyzed IBM's directions. IDC analyst Francis R. Gens claimed high-ranking officials in IBM's minicomputer groups provided the information to him.

That "9371" product line, based on rack-mounted CMOS technology, is scheduled to be shipped in late 1989 or 1990, Gens said. IBM reportedly has dropped plans for a 4381 successor positioned between the 9370 and 3090.

Other IDC observations included the following:

- The IBM System/36 and 38 follow-on product, code-named Silverlake and labeled "9380" by Gens, will ship in the middle of next year and cover a range extending from 1 million instructions per second (MIPS) to 12 MIPS, more than double the power of the current high-end System/38 Model 700.
- The low-end of the "9380" follow-on will be compatible with System/36 software but will be based on IBM Personal System/2 hardware.
- Despite the introduction of what IDC called the 9371 and 9380, IBM will continue to lose ground to Digital Equipment Corp. in the middle and low ends of its product line. Mainframe demand will continue to slow, with more than half of surveyed MIS shops citing "excess capacity" as a reason for not buying 3090s and with IBM's 370 architecture increasing its hardware market share by only one percentage point by 1991.
- Users will see little impact from IBM's OS/2, with features such as OS/2 Extended Edition not delivered until early 1989, and Systems Application Architecture (SAA) not delivered until the early 1990s as third-party vendors and users cautiously implement both.
- The first SAA products will be an office automation system announced in late 1989 or early 1990, although pieces of that system may appear earlier, in the form of Lotus Development Corp.'s 1-2-3 or Microsoft Corp.'s Presentation Manager. More general third-party packages will appear in 1990, and user-developed packages will be finished in 1991.

The observations were aired in a series of IDC seminars titled "IBM in Transition," which examined IBM's need to adapt and consolidate its product lines in an era of distributed processing, standards and declining demand for mainframes.

'Up' reports expected

One speaker, securities analyst Daniel C. Benton of the New York investment firm Goldman, Sachs & Co., said IBM this week will report third-quarter earnings of $2.10 per share, up from last year's $1.76.

He said that will be the first of four "up" quarterly reports, due largely to the impact of IBM's cost-cutting measures, but results may slip in 1989 as the company enters a transition period between the 3090 and the next-generation "Summit" mainframes.

Gens said one feature of Summit, which IDC expects to be announced in late 1989, will be the ability to interconnect eight to 10 Summit systems in a manner similar to DEC's Vaxclusters.

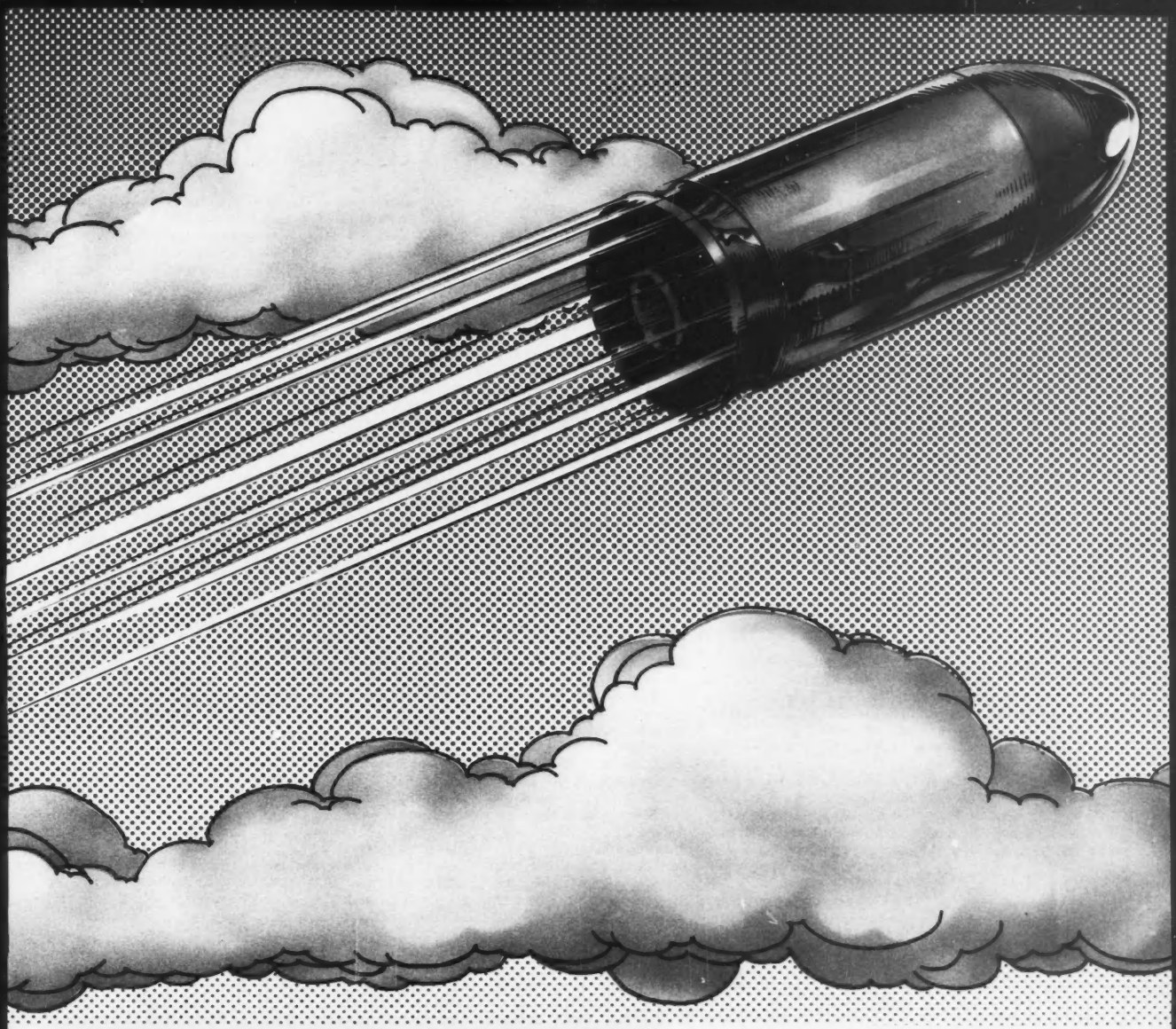
He said of the 1989-1990 delivery date of a 4381-9370 successor, which he called the 9371, "That means the 4381 will hang around for another year or two. My guess is that we'll see a price cut to keep it competitive during that time."

He also said the 9371 will support a theoretical limit of 16 processors, compared with the maximum of two processors in the 4381, with each of those 16 processors being added with the installation of one or two boards.

Gens said that what he called the 9380 System/3X follow-on product will look like the current 9370 because it will use the same card cage and power supplies and some of the same chips as the 9370.

However, Gens said users will be unable to convert a 9380 to a 9370. He predicted IBM will try to put the System/3X and 370 architectures on common hardware in a subsequent generation, possibly in the early to mid-1990s.

Gens also said it will be four to seven years before users see large portfolios of SAA applications. "IBM is one company, and one would think they should be able to write to a single interface. But, in effect, it is a lot of little companies, and to get the 370 Personal Computer and System/3X people all to write to a single interface is one of the biggest challenges IBM is going to face." He said 1988's shipments of 9370s could be boosted by the introduction of a low-end 9370 Model 10 during the first half of the year.



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System/36 PC successor joining mid-range intros

BY STANLEY GIBSON
CW STAFF

IBM will soon announce a replacement to its System/36 PC, according to sources in the System/36 PC community.

The new System/36 PC will be one of several mid-range products unveiled later this month, probably Oct. 20, according to IBM mid-range consultant David Andrews, president of ADM, Inc. in Cheshire, Conn.

The updated System/36 PC will run IBM's SSP operating system, like the model it replaces, according to both Andrews and a dealer who was briefed by IBM.

Andrews estimated that the new model will offer a 30% price/performance improvement over the current one.

"They have not been able to engineer a small enough Silverlake to carry the bottom end. This is an interim product to carry the bottom end until Silverlake is announced in 1988," he said. Andrews was referring to the processor, which IBM calls the "System/3X follow-on," that will reportedly merge the company's System/36 and 38 product lines.

Fills gap

The entry-level processor will fill the gap for a small multiuser system until the multiuser version of OS/2 arrives "in a couple of years," Andrews said.

The System/36 PC will use the IBM 9332 disk drive subsystem, which comes in 200M-byte and 400M-byte versions, he said. A smaller capacity disk drive could be announced with the new processor and will be intended for use across IBM's entire mid-range line, Andrews said. Other sources said they expect the major change in the processor to be that it will not require an attached IBM Personal Computer or compatible in order to function.

Instead, the PC board will be imbedded in the CPU cabinet. Currently, an attached IBM Personal Computer or compatible is required to boot up the System/36 PC.

Cost-effective

Using a dumb terminal instead of a PC is a more cost-effective approach, the sources said.

John McGilvreay, director of customer services at K & C Systems, Inc. in Woburn, Mass., said that if the PC is no longer used as a console, new tape and disk subsystems and new communications ports would be needed to be used with the new processor.

He said compatibility with the 9332 disk drive could infringe on IBM's 5362 "Baby 36" model, which is the next higher model in the line.

McGilvreay noted that SSP Version 5.1, intended to run on the System/36 PC, is now being distributed on 3½-in. hard disks intended for use on the IBM Personal System/2 Model 30, indicating the machine can now be used in conjunction with the System/36 PC.

That development promotes the likelihood that if a PC is imbedded in the new computer, it will be the PS/2 Model 30.

Andrews said the anticipated formal announcement of the RPG 2 and RPG 3 computer languages under IBM's Systems Application Architecture (SAA) may not be made Oct. 20 because of difficulties in reconciling the RPG languages with SAA's guidelines.

IBM has indicated to some industry sources that the RPG languages will eventually be brought into SAA.

IBM scores Vaxcluster victory

BY STANLEY GIBSON
CW STAFF

Striving to show it is not losing ground to Digital Equipment Corp. on its heartland mainframe turf, IBM announced last week it has displaced a Vaxcluster at a major DEC account.

Reebok International, Ltd., the Canton, Mass., marketer of popular athletic and casual shoes, said it installed an IBM 3090 Model 120E to manage worldwide production, customer service, inventory and financial control. The machine is the second Model 120E that IBM has shipped.

DEC could not comment on the Reebok account by press time.

Reebok's vice-president for MIS, Robert Slattery, said the reason for the switch was that the Vaxcluster did not perform adequately in Reebok's environment of an extremely high number of transactions, which could total 100,000 per day.

A typical transaction, an order from a retailer, lists a number of pairs of shoes, each of which may be a different style, color and size. All this must be tracked by the computer system, Slattery explained.

Plans upgrade

Because the Model 120E is not powerful enough to take over the full load of work from the Vaxcluster immediately, Slattery said he plans to upgrade the Model 120E to a 3090 Model 150E or 180E within the next year. The Vaxcluster, which will be phased out gradually, consists of two VAX 8650s and one 8700.

The VAX-based system can only be updated on weekends, but Slattery said he plans to update the 3090-based system on a daily basis.

Slattery said the operating system overhead of clustering and the speed of DEC's direct-access storage devices (DASD) slowed performance to an unacceptable level.

"If there is a very high volume of transactions, DEC doesn't have a very good answer," said Bob Randolph, a DEC analyst at International Data Corp. in Framingham, Mass. "This raises the flag as to how serious the problem in transaction processing is." (See story page 1.)

Randolph said that in order to solve the problem, DEC will have to modify its VMS operating system, build a teleprocessing monitor or build a uniprocessor capable of handling high transaction volumes.

Reebok's Slattery said the larger and faster IBM 3380 DASDs and the uniprocessor 3090 will offer satisfactory performance.

Currently running 35 disk drives — most of which are DEC RA 81s, although some are Fujitsu Ltd. RA 82-type models — Slattery said he will replace those with six double-density 3380 E model disk drives.

In addition, Slattery said he found software packages for IBM mainframes that closely fitted his needs and that the six-month free-delivery program announced with the 3090 Model 120Es clinched his decision.

He said he pushed for delivery on Sept. 30, in the fiscal third quarter, to enable him to account for depreciation for three full quarters before he makes any payment for the machine.

Growing at an extremely rapid rate through sales and acquisitions, Reebok went from $100 million in revenue two years ago to $900 million currently. Beginning as a DEC account in 1984, the company had planned to add VAXs incrementally as its needs increased.

Reebok started with a VAX-11/780. That machine was later clustered with two VAX 8650s. Earlier this year, a VAX 8700 replaced the 11/780.

When Slattery put the 8700 into the cluster, it improved performance by only 10%, he said, explaining that he expected at least 35% more throughput in going from 13 to 19 million instructions per second in processing power.

He said he paid DEC $75,000 to tune the system, without greatly improved results. Faced with a relatively small performance increase, Slattery drew up a capacity plan reflecting Reebok's anticipated growth and discovered he would have to add an 8700 every six months. "That was the thing that broke the camel's back," he said.

STANLEY GIBSON

Reebok International's Robert Slattery

Candle adds net access tools

LOS ANGELES — Candle Corp. further enlarged its product line beyond its MVS operating system performance monitors through the acquisition last Thursday of Netserve, a Chicago-based vendor of network-access software.

The acquisition adds three products to the Candle family, which includes the MVS, CICS and IMS versions of the Omegamon monitor: CL/Supersession, CL/Gateway for IMS and CL/Gateway for MVS, all designed for users of IBM 3270 terminals.

CL/Supersession provides facilities for maintaining multiple concurrent sessions between individual 3270-compatible terminals and multiple VTAM-based application subsystems.

CL/Gateway for IMS offers advanced network access and control for IMS/DC systems, while CL/Gateway for MVS provides network control and security facilities.

The products will cost $20,000 to $35,000 each.

The products move Candle into the session-management marketplace, Candle President Aubrey Chernick said. They also provide the underlying technology for a series of end-user tools, he said.

IBM pushing PS/2 Model 60 with 'temporary' price cut

BY ED SCANNELL
CW STAFF

IBM has reduced the price of its Personal System/2 Model 60-071 from $6,295 to $5,795 as part of a limited promotion effective Oct. 1 and lasting until the end of the year.

Company spokesman Jim Monahan said the promotion's intent is to introduce IBM's customers to the system's benefits, which include an enhanced small-device interface that allows the model to transfer data at 10M bit/sec., the ability to accept 70M- or 115M-byte fixed disk drives and greater expansion capabilities.

"You can add up to 115M bytes with it [the PS/2 Model 60-071], where you can only add 44M bytes to the PS/2 Model 60-041," Monahan said.

Asked whether IBM will raise the price of the system the first of next year, Monahan declined comment except to say such promotions are not unusual.

Dealers contacted last week, however, said they believe IBM will keep the model at the promotional price if it helps increase sales.

"I have never seen IBM increase prices after one of these promotions," said Matt Fitzsimmons, a Computerland, Inc. dealer based in White Plains, N.Y. "I suspect this promotional price will become permanent."

Other observers agreed, noting that IBM usually holds such promotions to beef up fourth-quarter sales of its products.

No dealers interviewed last week said they think the temporary price cut is intended to give breathing room for the much-rumored PS/2 Model 70, a desktop Intel Corp. 80386-based system positioned between the PS/2 Models 60 and 80.

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Data Center photograph courtesy of Genix Corp.

Banyan unveils spreading Vines

System update answers calls for expanded management, security features

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — Banyan Systems, Inc. last week announced Release 3.0 of its Vines distributed network operating system, featuring expanded network management and security capabilities.

"It's just a phenomenal security package," said Jerry L. Short, manager of Court Consultative Services for the Judicial Council of California and a Banyan user. "It's what we have asked for."

Vines 3.0 will reportedly provide full support for IBM PC-DOS 3.3, Transmission Control Protocol/Internet Protocol (TCP/IP) and several new networks, including Western Digital Corp.'s Starlan and Micom-Interlan, Inc.'s NI5210 Ethernet card.

When Vines 3.0 ships in December, Banyan will also ship two products announced earlier in the summer that require the latest release of Vines: Vines/386 for Intel Corp. 80386-based servers and Vanguard, a security package.

Integrated with Vines' Streetalk distributed naming service, Vanguard features include audit trails, reporting tools, password encryption, user expiration dates, dial-in limitations and restrictions on users' ability to change their network profiles.

Delivery to customers who have purchased support contracts will be free. Options such as Banyan Mail, mainframe and mini connectivity features, TCP/IP, network personal computer printing and new local-area network support are priced separately.

In step with competition

"Banyan has kept pace with the competition in some critical areas," said Michael Goulde, a senior analyst with The Yankee Group in Boston.

In some cases, Banyan has gone beyond that competition, he said, citing Vines' ability to do network diagnostics from anywhere on the network across multiple servers.

The announcement included the following:

- Two TCP/IP options: Server-to-server communications, which allow users with a backbone TCP/IP network to connect remote Banyan servers; and a routing option that permits Banyan servers to route Internet Protocol frames, allowing users to save the expense of purchasing dedicated routers.
- Faster small-file transfers. The round-trip time for file-record access has been reduced by 66% from that of Release 2.1, according to Banyan.
- Banyan Mail. Improvements reportedly include external mail-system addressing, as well as the ability to add components to forwarded messages, to include Microsoft Corp. MS- and PC-DOS text in mail messages and to view information attached to messages without having to edit mail.

Users with incompatible word processors can read each others' documents.

- Host connectivity. Users have the option of a hot-key switch between IBM 3270 sessions and MS-DOS applications.

Also added were up to four simultaneous logical unit sessions, asynchronous terminal emulation scripting and compatibility with Microstuf, Inc.'s Crosstalk XVI scripts.

- Maintenance. Features include new system adminstration and management tools, including a "group move" facility and improvements to Banyan's access rights list.
- Reliability. Administrators can use read-after-write disk verification with dynamic bad-block remapping.

Not mentioned was support for IBM's LU6.2, which was promised for this release of Vines.

A source explained that Banyan decided to give LU6.2 to developers first to generate useful, distributed applications.

Still, users were enthusiastic about the latest Vines release.

Use it all

"We'll use everything; the addition of these enhancements won't cause a [performance] problem," said Jonathan Oski, technical engineer in charge of network planning for Boston-based Bank of New England NA.

"Our auditors were insistent that we enhance our security for certain financial applications," he explained.

Oski has a number of 286-based servers that he would like to upgrade and thus is very interested in Vines/386. Although some users want to utilize IBM's Model 80 as a file server, Vines/386 will not immediately support IBM's Micro Channel architecture on the server side.

VAX support next

Banyan Systems, Inc. next week will unveil a version of Vines, its distributed network operating system, for Digital Equipment Corp.'s VAX environment, according to an informed source.

VAX support is important for many Banyan users, who use the VAX as a mid-range system for number crunching and investment tracking, according to Douglas Gold, an analyst with International Data Corp. in Framingham, Mass.

Gold said he expects Banyan to provide users with DEC VT200 emulation and a VAX-to-IBM Systems Network Architecture link.

Another reason to consider Vines for the VAX came from a user whose firm plans to drop a token-ring backbone for DEC's Decnet.

"Vines on a VAX could be lucrative, no doubt about it," said Greg Boyd of I-LAN, a network integrator in Columbus, Ohio, that resells Banyan and Novell, Inc. software. "Of our customers, 15% use the VAX as their major architecture. Of the 85% that are primarily IBM, a third have VAXs as their middle tier," he explained.

What is important is not so much being able to plug into the DEC world, cautioned Michael Goulde, a senior analyst with The Yankee Group, but enabling applications to run transparently across the network.

PATRICIA KEEFE

VMS fault

FROM PAGE 1

sion 5.0 documentation. The user speculated that a beefed up VAX quad processor will likely follow on the heels of Version 5.

DEC officials refused to comment on Version 5.0, but Gail Ferreira, product manager for DEC's Application Control and Management System (ACMS), said the company will have major on-line transaction processing (OLTP) announcements before the end of its fiscal year in June 1988.

Although the current version of VMS runs a dual-processor VAX 8350 or 8800, it does so in an asymmetrical or master-slave fashion, which limits the combined efficiency of the VAX, according to Bob Randolph, director of the DEC Advisory Service at IDC, and spokesmen for The Yankee Group, based in Boston.

Version 5.0, currently in beta testing, will run VAXs symmetrically or as coprocessors with equal status before a single operating system, thereby increasing throughput, Randolph said. But it is uncertain whether symmetrical multiprocessing will be enough to upgrade VMS status as a second or third choice as a transaction processing system.

As DEC continues to push into corporate data processing, its transaction processing ability will become more of an issue as competitors — especially IBM — try to counter its thrust.

Thus, a software bottleneck is threatening to choke off the success story of DEC hardware. For the company to continue to exploit expanding markets, it must resolve the bottleneck or it will "hit the wall sometime in late 1988 or early 1989," Randolph predicted.

Over the wall

Transaction processing is not the only challenge DEC faces, but improvement in that area "pushes the wall further back," Randolph said, giving the company time to counter the transaction processing capabilities of competitors.

A recent report from The Yankee Group said "DEC's on-line transaction processing products lack serious merit, a cause for consternation at DEC headquarters." So far, DEC has been able to finesse the issue by selling VMS and related products on the basis of their common architecture across VAX hardware and their communications capabilities, according to John Logan of The Yankee Group.

Although the VAX 8530 and 8550 offer highly competitive price/performance on the basis of million instructions per second, those systems' cost per transaction/sec. is about twice that of other vendors' systems, the study said.

Heart of the problem

The core of the problem lies in VMS's roots as a time-sharing system. Instead of capturing a transaction and running it in its application until results can be returned, VMS acts more on a clocked, interrupt basis, serving one user for a set amount of time before dropping the task — uncompleted if necessary — to take up another.

This characteristic limits VMS to pushing 15 transaction/sec. through a VAX 8650 processor, using a standard ET1 transaction processing benchmark. IBM's System/88 Model 84, a four-processor machine, is capable of 45 transaction/sec. under the ET1 benchmark, according to The Yankee Group. The IBM 3090 Model 400 with four processors registers 850 transaction/sec. in the ET1 benchmark, according to The Yankee Group.

IBM's MVS/XA operating system for the 3090 remains an extension of the batch-oriented 370 architecture and is not optimized for OLTP, Logan said. But the 3090 mainframe's larger buffers, main memory and expanded storage mean more transaction elements can be operated on without paging to disk, according to Logan.

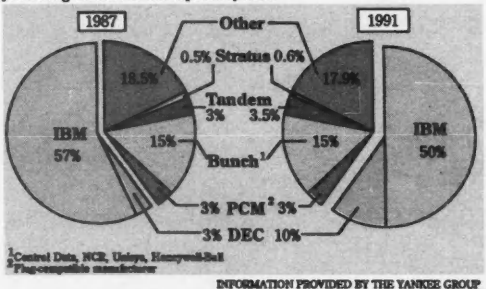
The Yankee Group predicted DEC will begin to phase in stronger OLTP products during the next three years, beginning with VMS Version 5.0.

"The easiest approach favors a software layering over VMS. But this will be technically difficult, because some VMS features, such as I/O write-throughs, are at the lowest levels of VMS," The Yankee Group report said, adding that DEC supplies no software tools for high-performance OLTP.

Only the most demanding networks require more than 10 transaction/sec. today. This means that 90% of all DEC users can get by with DEC's 15 transaction/sec. capability or add a VAX for a second network, providing increased demand for DEC processors. But as needs grow, VMS's limitations will become more evident.

Transaction time

DEC is predicted to increase its share of the on-line transaction processing market at the expense of IBM



[1]Control Data, NCR, Unisys, Honeywell-Bull
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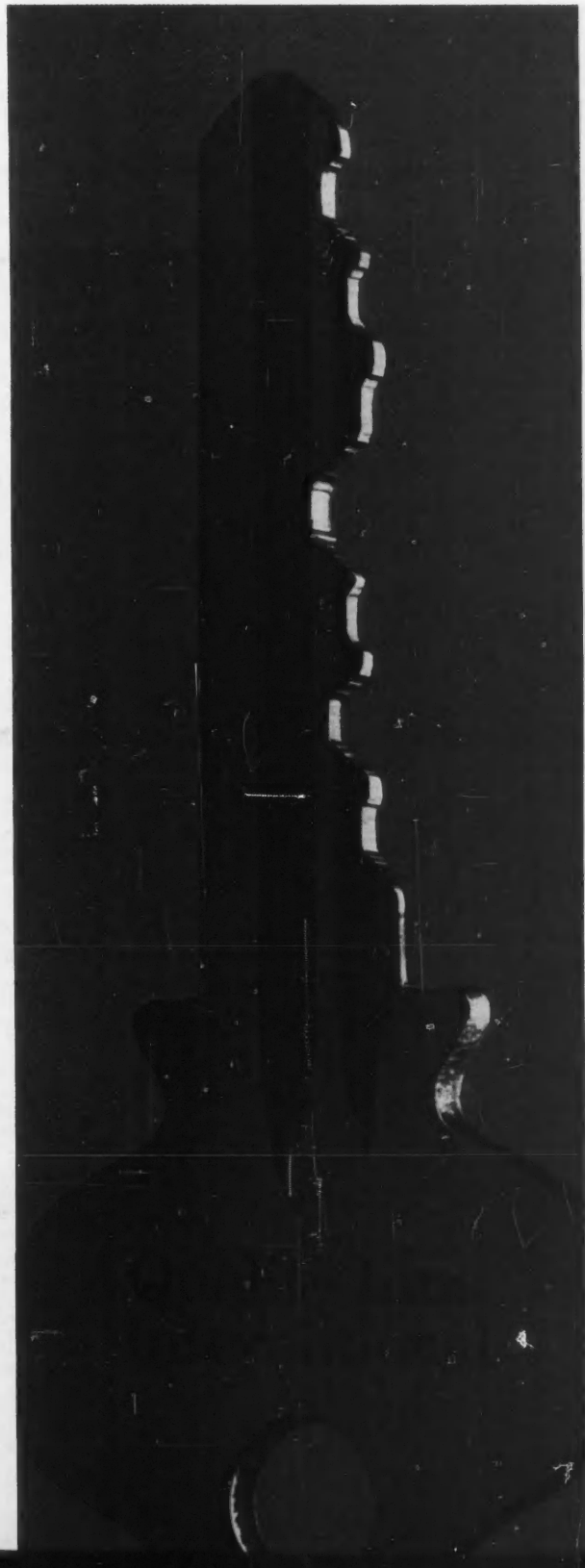

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Lotus taking on all comers

Mac 1-2-3 firms claim to spreadsheet throne

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — With the announcement last week of 1-2-3 for the Apple Computer, Inc. Macintosh, Lotus Development Corp. sent out another signal that it intends to position 1-2-3 as the spreadsheet standard for most major hardware architectures.

If the multiarchitecture standardization of 1-2-3 succeeds, it will help keep Lotus competitors at bay in the spreadsheet market, according to observers.

However, this strategy will take some time to be realized. Lotus will not announce details of the Macintosh product, including its ship date and price, until the second half of 1988.

Lotus also announced that Modern Jazz, formerly codenamed Galaxy, will ship in the first quarter of 1988. The product was originally scheduled to ship last summer, but Lotus delayed the debut to add features requested by beta-test users, company officials said.

Spreadsheet wars

The announcements came just one day before Microsoft Corp. unveiled an IBM Personal Computer version of its Excel integrated spreadsheet, which will battle current and future versions of 1-2-3 in the high-end spreadsheet market.

Excel is currently one of the most popular applications for the Macintosh and accounts for 12% of all spreadsheets recently purchased by dealers, according to market research firm IMS America Ltd., based in Plymouth, Pa.

The Macintosh version of 1-2-3 will be developed in parallel with 1-2-3/G, the IBM OS/2 Presentation Manager version of 1-2-3, said David Tarrant, general manager of Lotus's graphics and document product division.

Despite the long wait for the product, Lotus is expected to implement 1-2-3 aggressively across architectures. A key part of this effort involves rewriting 1-2-3 from assembler to the more portable C language.

Lotus sources have previously reported that work is under way on a version of 1-2-3 for Digital Equipment Corp.'s VAX minicomputers, and analysts and some sources have predicted a version that will run under Unix.

Lotus has already announced 1-2-3/M, which is being jointly developed with IBM, that will run on IBM's 370 family of mainframes.

Spreadsheet

FROM PAGE 1

dersen & Co. and Manufacturers Hanover Trust Co. pledged support for Excel.

"We have the best spreadsheet," boasted Microsoft Chairman Bill Gates. He added that Excel is "dramatically faster than 1-2-3." Excel has not, however, been benchmark-tested against 1-2-3 with Speed-up, a recently shipped Lotus utility that dramatically accelerates spreadsheet recalculations.

While Windows provides an easy-to-use interface and advanced data sharing capabilities, some users may find its price hard to swallow. Because graphics-based applications consume both memory and CPU cycles, Excel will only run on more expensive 80286- and 80386-based machines. Additionally, Excel requires high-resolution graphics — an IBM Enhanced Graphics Adapter board and compatible monitor are the minimum suggested — and 640K bytes of random-access memory. Both a hard disk and a mouse are also strongly recommended.

As a result, Excel will not run roughshod over 1-2-3, at least in the current Microsoft MS-DOS environment, according to analysts. "I'd be very surprised if they took a 10% market share" during the next year, said Bill Higgs, director of software research for Infocorp. Microsoft declined to forecast Excel sales.

Hardware requirements have also kept Lotus from developing a Windows version of 1-2-3. Lotus said it prefers to wait for the release of IBM's Presentation Manager component of OS/2 before it releases a graphics-based spreadsheet. Lotus Vice-President Michael Kolowich recently said the firm has decided not to "shoehorn" an application into an MS-DOS graphics users interface such as Windows.

Windows product coming

Lotus, however, has not ruled out Windows applications completely. "There is still a Windows product under development, but it is not 1-2-3," Lotus spokesman Greg Jarboe said.

Some firms are more than willing to pay the high price of implementing a graphical user interface. Arthur Andersen, a longtime 1-2-3 diehard, is moving to switch its 18,000 1-2-3 users over to Excel. "We plan to move our auditors to this new platform using Portable/386 microcomputers and products such as Windows/386. Microsoft Excel allows us to make this move today," commented L. Jack Dreiss, who is director of development for the advanced computer audit techniques group at Arthur Andersen.

Another believer is Arthur Block, a vice-president at Manufacturers Hanover. "Over time, Manufacturers Hanover will have an 80386 machine on most account officers' desks. We expect to see Microsoft Excel on all of these machines," Block said.

But unlike many of Lotus's recent competitors, Excel is not keystroke-compatible with 1-2-3. The irony is that while keystroke compatibility cuts down the training for users familiar with 1-2-3, it also opens the possibility of a copyright infringement lawsuit from Lotus.

In addition, Excel is only 95% compatible with the Lotus macro language. Lotus itself provoked the ire of users when it forced many to move to 1-2-3 Release 2, which is not fully compatible with the earlier release of 1-2-3.

As a result of such issues, many users familiar with Excel are sticking with the tried and true 1-2-3. While Fred M. Zickert, personal computer coordinator for Eaton Corp., said he believes Excel is a better product, he also said he will not switch to Excel because of the firm's investment in Lotus training.

'Keep it simple'

Vahe Katros, MIS PC coordinator for Wm. Filene's Sons Co., said, "Keep it simple." He said most Filene's users are just getting comfortable with 1-2-3. "The inclination for someone at that stage to consider another package is low," Katros said.

Shops with a mixture of 8088- and 80286-based machines may have difficulty standardizing on Excel. But Microsoft has an answer for that problem in the form of a $995 bundling arrangement under which customers receive both Excel and the Mach 20, a 286-based accelerator board. Microsoft is making the product, which comes on 1.2M-byte disks for IBM Personal Computer ATs and compatibles, available on 360K-byte floppy disks.

One skeptic, who earlier said that in order to unseat 1-2-3, a product would have to "cure cancer, taste like chocolate and cost a dollar," was impressed. "It tastes like chocolate," admitted Jack McGrath, a consultant and editor of "@Max," a newsletter for 1-2-3 users.

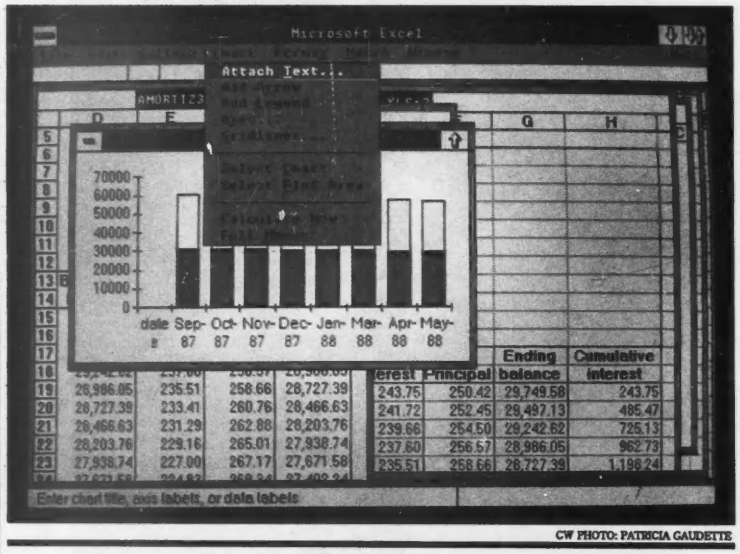
Lotus has been preparing for the Excel barrage for some time. The firm recently began shipping Speed-up, a utility that only recalculates cells that have been modified, and Learn, a macro recording utility. In addition, Lotus offers HAL, which addresses two of Excel's strengths. HAL allows users to link separate worksheets and provides an easier to use interface.

"There is nothing in the product that will require us to go back to the drawing board in 1-2-3 Release 3, or 1-2-3/G or 1-2-3/M," Lotus's Jarboe said.

Staff writer Alan J. Ryan and Senior Editor Ed Scannell contributed to this report.

Trump cards

Excel's customized graphics, pulldown menus and use of Microsoft's Windows are intended to blunt Lotus's dominance of the PC spreadsheet market



CW PHOTO: PATRICIA GAUDETTE

Intel checks in with $500M quarter

SANTA CLARA, Calif. — Capitalizing on the current high demand for personal computers and workstations, semiconductor maker Intel Corp. last week reported a highly profitable third quarter in which sales topped $500 million.

In the quarter ended Sept. 26, the microprocessor leader reported operating profits of $52 million, or 29 cents per share, on revenue that jumped 55% from year-earlier levels to $501.1 million. In the like quarter a year ago, Intel lost $114.2 million, or 65 cents per share, on sales of $324.1 million.

Intel's total profits in the most recent quarter included a $29 million, or 16-cent-per-share, extraordinary gain from the use of net operating loss carry-forwards.

The company also reported record revenue of $1.33 billion for the first nine months of 1987, a 47% increase over the $909 million reported for the similar period in 1986.

Intel's rebound is outpacing most of the major chip makers', according to Paul Johnson, a semiconductor analyst for L. F. Rothschild & Co.

"The fact that the PC business is booming hasn't fallen on deaf ears at Intel," Johnson said. "Intel has a larger part of its business going to PCs and low-end workstations, where sales are growing faster than the rest of the computer industry."

After some two years of semiconductor industry overcapacity, Intel is now hurrying to expand its production capability, Johnson said.

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M&D seeks to calm users of halted tool

BY ROSEMARY HAMILTON
CW STAFF

NATICK, Mass. — McCormack & Dodge Corp. is seeking to soothe a small group of users of a recently discontinued product for fear that there could be a ripple effect through the industry, a company executive said last week.

M&D plans to make an official statement to users this week in response to their concerns about the future of discontinued accounting software for Hewlett-Packard Co. HP 3000 series minicomputers. It also confirmed that it is actively hunting for a buyer that can take over the product line.

Last summer, M&D informed its HP 3000 users, who number approximately 100, that it would be phasing out products for their systems. HP 3000 users account for about 5% of M&D's customer base, according to John Birch, corporate vice-president. Although the users are a small portion of the customer base, Birch said, "We are dealing with the situation with thoughts of how they will react to M&D in future situations."

Let's make a deal

The company has offered incentives for these users to move to its software offerings for other hardware platforms, Birch added. Users willing to make a move to IBM System/38-based packages can do so free of charge, he said.

Users contacted last week said that in addition to their disappointment, they are anxious for more specific information from the company because they are unsure how to proceed from here.

"I think most of us are in a wait-and-see mode," said Thomas Winter, assistant to the plant accountant at Union Camp Corp., a paper manufacturer.

Winter, who also serves as chairman of the M&D HP 3000 Users Group, said many users are concerned about the extent of support the company will provide in the future if a buyer for the software is not found. Initially, M&D said it would provide full support for one year and limited support thereafter. Exactly what limited support will entail should be announced this week, Birch said.

Since July, users have raised about 12 issues concerning the software's future, Birch said, and a formal reply will be offered Oct. 15. On the agenda will be such items as what users will have to pay for maintenance next year and how they can receive enhancements for the software.

M&D opted to discontinue its accounting packages for the HP 3000 series because "we saw that we could make a lot more money and better use of our resources if we narrowed our focus," Birch said. The company currently sells its software for IBM mainframes, System/36s and 38s as well as Digital Equipment Corp. VAXs.

Telemail opened to private nets

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — Fueled by its goal to provide interoperability among independent electronic-mail vendors, Telenet Communications Corp. last week announced the availability of a connection between its own public Telemail service offering and various vendors' private mail networks.

At the Electronic Mail Association Conference here, Richard Kozak, Telenet's vice-president and general manager of messaging, said some 130,000 domestic Telemail users can now communicate with users of the Data General Corp. Comprehensive Electronic Office (CEO) office automation system.

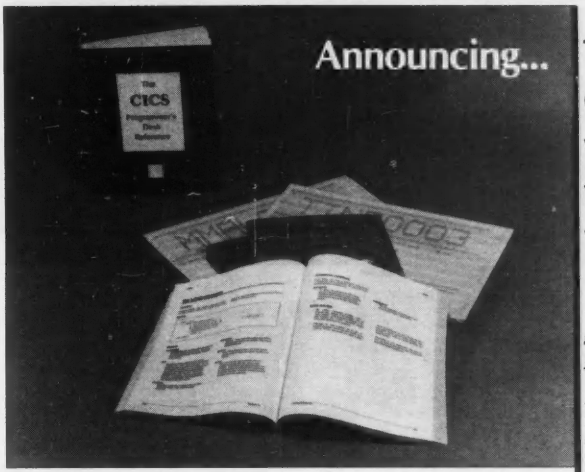
According to Kozak, users of Digital Equipment Corp.'s All-In-1 will be able to access Telemail by December.

The service requires that DG and DEC users subscribe to Telenet's electronic-mail service. Users must also have CCITT X.400 software loaded on their host computers. According to Kozak, Telenet is in active discussions with at least 10 vendors, including IBM and Hewlett-Packard Co., for similar applications.

Prior to the DG announcement, Telenet officials said DG had been undergoing conformance testing with Telemail at Telenet laboratories in Reston, Va.

Some 16,000 CEO users at DG in Massachusetts are currently linked to Telemail users working at Bridge Communications, Inc. in California. CEO users at the U.S. Department of Agriculture Forest Service in Washington, D.C., are beta-testing the messaging capability with Telemail users at the Department of Labor and state foresters around the country.

Kozak said Telenet is aggressively working with its overseas Telemail users to make similar connections. The challenge, he said, is working with various countries' telecommunications agencies to make the link possible. A milestone will be reached when users of DG, DEC and other private electronic-mail systems can exchange messages using Telemail.



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McDonnell Douglas shifts mainframe gears

Replaces EDI-Net's IBM iron with faster Tandem system to handle increased traffic

BY JEAN S. BOZMAN
CW STAFF

ST. LOUIS — McDonnell Douglas Corp.'s EDI-Net service will be running on Tandem Computers, Inc. Nonstop VLX systems next year, replacing an IBM mainframe system that has been supporting the service since 1984.

In 1985, McDonnell Douglas began shopping for a replacement for the IBM 3032 that had replaced an IBM 4341 used by EDI-Net since 1981, according to David Lonsdale, director of marketing and support for McDonnell Douglas's Applied Communications Systems Division. Lonsdale said IBM bid on the contract, and although the IBM system was a large applications processor, it "was not communications-oriented or transaction processing-oriented enough." McDonnell Douglas remains one of IBM's largest customers, however.

"We were looking for fault tolerance and a high-speed transaction processor," Lonsdale said last week.

"At that time, the IBM machines were not communications-oriented enough for our application," he said.

The decision to move the EDI-Net service from IBM's VM/CMS environment to Tandem's Guardian operating system was made shortly after McDonnell Douglas's 1984 acquisition of Tymshare, Inc. (now Tymnet, McDonnell Douglas Network Systems Co.), which owned the Tymnet network. Tymnet started an electronic data interchange, or EDI, service in 1981. Today, EDI-Net has 650 customers, mainly in the U.S., and supports more than 7,000 electronic links.

Among the candidates that sought to replace the IBM system were Digital Equipment Corp. and fault-tolerant systems vendor Stratus Computer, Inc., Lonsdale said. "Tandem's VLX fell clearly in line with our strategy, and we were able to develop a relationship with Tandem that resulted in Tandem consultants aiding our development project."

The EDI-Net hardware changeover should be transparent to most end users, Lonsdale said. He would not provide details about any changes in logon procedures or screen formatting, but he said such changes would be minor.

EDI-Net users contacted by *Computerworld* seemed unconcerned about the move to Tandem. One was George Klima, director of accounting systems for Super Valu Stores, Inc. in Eden Prairie, Minn., which has been using the EDI-Net service since 1981. "We use EDI to reach more than 1,200 vendors in the U.S. from our IBM Personal Computer," Klima said last week. "We feel that it's a very good service, and we just have to trust that the addition of the Tandem machines will be a further improvement."

In recent months, a 20-programmer development team in San Jose, Calif., has been migrating the McDonnell Douglas EDI application to the Tandem architecture, planning a switch over to a four-processor VLX system in St. Louis by mid-1988. The California team started development work on a Tandem Nonstop TXP processor, which was recently upgraded to a two-processor VLX system.

Future plans call for the addition of more Tandem Nonstop VLX processors to the EDI-Net network. McDonnell Douglas is also exploring the possibility of supporting the CCITT X.400 standard by the 1990s.

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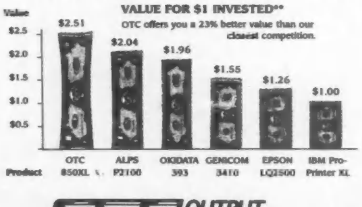

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VM/SP update ready to go

RYE BROOK, N.Y. — IBM last week said the high-performance version of its VM/SP Release 5 operating system will be available next month.

With the announcement, IBM said it will add features to the VM/SP High-Performance Option (HPO) that were not included in the product's January announcement.

VM/SP HPO Release 5 is intended for large IBM 370 hardware in the IBM-designated Groups 30 and 40.

New functions include a process to better manage data once a user goes beyond the 16M-byte limit. Called Dynamic Paging Area load relief, the feature is said to allow users to temporarily store programs above the 16M-byte line rather than send them to disk storage, which had been the procedure previously.

A second feature decreases use of the system-lock facility, which restricts access to the CPU. By increasing the number of functions that are no longer restricted by the system lock, the feature enables a user to make more efficient use of CPU time, IBM claimed.

The release also includes support of multiple foreign languages, a feature IBM first brought to VM with the introduction of VM/SP Release 5.

The one-time charge for a Group 30 processor license is $57,665, while a Group 40 license costs $69,210.

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CA	Lafayette	Nov 10
	Los Angeles	Oct 15, Oct 29, Nov 12, Dec 8
	Newport Beach	Oct 6, Dec 15
	Sacramento	Oct 15, Dec 10
	San Diego	Oct 8, Dec 17
	San Francisco	Oct 14, Nov 17 Dec 15
	San Jose	Oct 7, Nov 5, Dec 3
CO	Denver	Oct 15, Nov 12, Dec 15
CT	Hartford (Farm.)	Nov 3, Dec 8
	New Haven	Oct 14, Nov 12
DE	Wilmington	Oct 1
FL	Ft. Lauderdale	Nov 5
	Orlando	Nov 4
GA	Atlanta	Nov 11
	Augusta	Dec 9
IA	Des Moines	Nov 17
ID	Boise	Nov 19
IL	Chicago	Oct 15, Nov 18, Dec 15
	Springfield	Nov 10
IN	Indianapolis	Oct 20, Nov 24, Dec 17
KS	Wichita	Oct 6
LA	Baton Rouge	Oct 22
	New Orleans	Oct 23
MA	Boston	Oct 20, Nov 10, Dec 15
	Burlington	Dec 2
	Springfield	Nov 17
	Worchester	Nov 5
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	Baltimore	Oct 8, Dec 17
	Bethesda	Oct 6, Oct 27, Nov 24, Dec 15
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MI	Detroit	Oct 13, Nov 12
	Grand Rapids	Nov 4
	Traverse City	Oct 28
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	Pittsburgh	Oct 20, Nov 4, Dec 8
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	Memphis	Oct 14, Dec 10
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	Dallas	Oct 6, Nov 4, Dec 9
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	Milwaukee	Oct 14, Dec 3

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DG inks net switching pact with Japan's NTT

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — In the hope of making its superminicomputers an integral part of the next generation of private corporate networks, Data General Corp. last week announced a strategic alliance with Japan's Nippon Telegraph and Telephone Corp. (NTT).

DG and NTT signed an agreement to jointly develop the first network system to integrate packet and circuit switching that would allow corporate users to more efficiently use the capacity of their wide-area digital networks.

Officials provided only sketchy details about the product development program, code-named Asparagus, but said the so-called "hybrid exchange system" will be customer-premise equipment. DG's Eclipse MV family of superminicomputers will be embedded in the system and linked to communications processors that perform the switching functions.

Furthermore, officials said digitizing technology will be employed so that voice, data and images can be integrated on the same T1 lines. The system is expected to accommodate the Integrated Services Digital Network and Open Systems Interconnect standards as well as IBM's Systems Network Architecture.

Assuming development proceeds successfully, NTT will offer the system in Japan in the spring of 1989. DG, based in Westboro, Mass., will market its own version in the U.S. and other countries shortly thereafter, according to DG President Edson D. de Castro.

Colin Crook, senior vice-president of DG's Communications Systems Group, noted that the Asparagus effort is part of DG's long-term expectation to sell more DG processors in network systems than in traditional DP applications.

Crook and de Castro said Asparagus is a low-risk project based on existing technology and it will benefit from NTT's financial assistance, but they declined to specify the dollar amount.

Much of the research and development work will occur at Data General Telecommunications, Inc., a division in Rockville, Md., that was formed after the February acquisition of Dama Telecommunications Corp., and at Genioss, Inc., a division in Dallas that was formed after the December 1986 acquisition of the integrated data network operation of United Technologies, Inc.

The investments in the small firms have been a financial drain on the company for the past two years, but they have enabled DG to enter the networking field and attract partners such as NTT, de Castro said.

"The investor demand for short-term profit performance in the U.S. runs counter to such long-term programs," he said. DG, which reported a $65.1 million loss in its second quarter, has been beset by financial problems and layoffs [CW, July 27].

NTT, a giant telecommunications firm based in Tokyo, was interested in the alliance with DG for competitive and political reasons. NTT is facing increasing competition for corporate customers due to Japan's deregulation and privatization of network services, according to Takahiko Kamae, director of research and development for NTT's Integrated Communications Systems Sector.

3Com tightens DEC alliance

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — Local-area network vendor 3Com Corp. will pursue a stronger relationship with Digital Equipment Corp. in an effort to become a leading supplier of networking products for multivendor environments during the next year and a half.

3Com Chairman Bill Krause, speaking at last week's Montgomery Securities 17th Annual Investment Conference, held here, said that strengthening will result in the development of DEC products and some comarketing.

"DEC is a major player in the computing market, and we decided that we should move to strengthen our strategic alliance with DEC," Krause said.

At the recent Decworld '87 conference, DEC and 3Com revealed that, during the past year, they had worked together on an Ethernet-adapter technology that links DEC workstations over unshielded twisted-pair wiring.

Additionally, DEC has been reference-selling 3Com controller boards, noted Gail Daniels, DEC network marketing manager. "We have no ongoing contractual agreements for anything else, but it would not be surprising if we decided to enter into other areas together," she said. On its own, 3Com is working on an enhancement to the 3+ software line that ties 3Com to a VAX VMS operating system from DEC. Bob Bressler, vice-president and general manager of the 3Com products division, said the 3+ tie is a must since many Bridge customers link Bridge products to DEC computers.

Sequoia launches second OLTP system

Series 200 will provide three times the transaction throughput of long-delayed predecessor

BY JAMES CONNOLLY
CW STAFF

MARLBORO, Mass. — Sequoia Systems, Inc. is scheduled to release its second-generation on-line transaction processing (OLTP) system today, with claims that it has overcome the problems of its first system, which was not delivered until two years after announcement.

Sequoia said in press briefings last week that the Series 200 will provide three times the transaction throughput of the Series 100, which was announced in 1984 and began shipping to the first of only 12 customers in 1986. Sequoia also claimed the Series 200 provides better price/performance than OLTP systems sold by Tandem Computers, Inc. and Stratus Computer, Inc.

Sequoia said a six-processor Series 200 runs at 83 transaction/sec. on the ET1 Debit-Credit benchmark, compared with 26 transaction/sec. for a slightly more expensive Tandem VLX and 50 transaction/sec. for a less expensive Stratus XA2000. Based on those figures, Sequoia claimed a cost per transaction of $11,200, compared with $38,000 for Tandem and $16,600 for Stratus.

"We're a long way down the road now, because we have key reference accounts," said Sequoia President William C. Grover of the difference between the company in 1984 and today. Sequoia said Series 200 systems are already installed at several customer sites.

One of those customers, New York-based QV Trading Systems, Inc., reported that while the Series 200 offers speed advantages over the Series 100, it also has some of the bugs that an early user expects.

The key technical differences between the Series 100 and the Series 200 include the replacement of Motorola, Inc. 10-MHz 68010 microprocessors with 20-MHz 68020 chips. Sequoia Executive Vice-President Jack J. Stiffler said the newer chips double performance.

Like the Series 100, the Series 200 runs Sequoia's Topix operating system, which the company claimed is compatible with AT&T's Unix System V, University of California at Berkeley's Unix 4.3 and Pick Systems' Pick Open Architecture.

'Had the hiccups'

QV Trading has been running a Series 100 for several months and a three-processor Series 200 for one month. "We got the 68010 last spring and, to be honest, it had the hiccups for a few months," said William Weeden, chief financial officer for QV Trading, which supports securities trading. "We never really tested it to its full capacity, keeping it at 10% to 20%."

Weeden said one of his Series 200's three processors, supporting 400 users, recently shut down because of a problem with a cable. He said he was satisfied with Sequoia's response but had to delay shutting down the full system to carry out the replacement. "We couldn't bring it down because the customers got used to the increased speed too quickly," he said.

Weeden reported that the Series 100 will be upgraded with the faster processors this week.

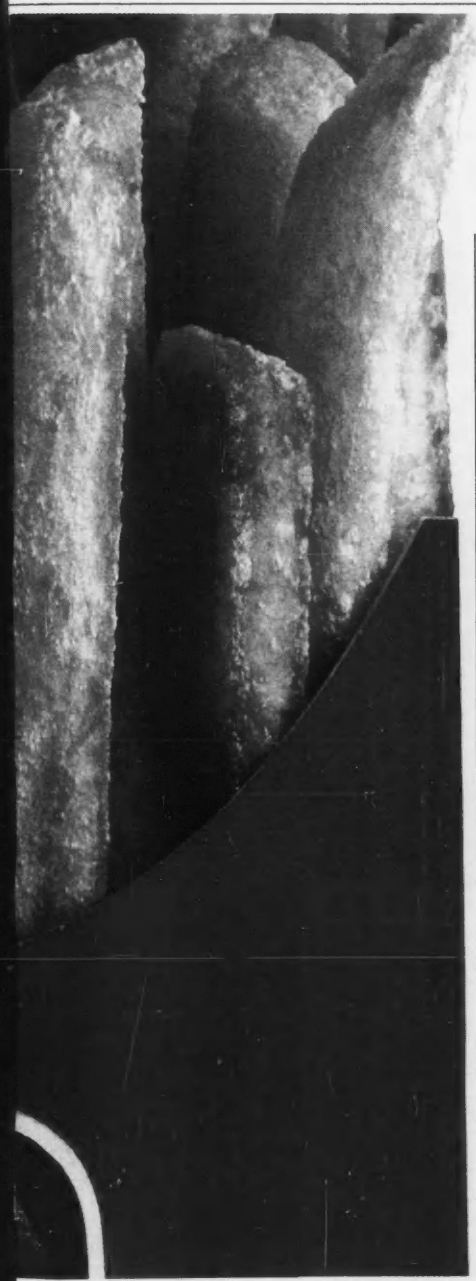
An analyst briefed last week said Sequoia needs to sell 10 or 20 more systems to attain market credibility. "Credibility is the whole thing," said analyst David Moschella of International Data Corp. in Framingham, Mass. "At least a half-dozen companies have failed trying to do what they want to do."

Moschella noted that Sequoia has recognized that it and other companies erred in the past by trying to port Unix directly to an OLTP system. He said Sequoia has corrected that by building its system around a Unix kernel.

Grover claimed Sequoia holds advantages over Stratus and Tandem in that Sequoia's multiprocessor architecture has more room to grow incrementally with the addition of more processors or the substitution of a faster chip.

Under that architecture, two microprocessors in each processing element perform the same task and compare results. If those results differ, the processing element is shut down, and the task is returned to a ready queue to be redone by another processing element.

A Series 200 with six processing elements, 64M bytes of memory, two I/O processors, 13 disk drives and system software costs $929,000.



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PS/2 boards to be micro crowd pleasers

BY JAMES A. MARTIN
CW STAFF

A new generation of add-in boards, expected early next year, will piggyback multiple microprocessors onto the Micro Channel architecture bus in IBM's Personal System/2 computers. Developers predict their enhancements will perform concurrent tasks and support multiple users with an efficiency not previously possible on a microcomputer.

The add-in boards, currently in the works by AST Research, Inc., Quadram Corp., Cumulus Corp., Orchid Technology and others, will enable users to add at least 14 additional microprocessors to PS/2 Models 50, 60 or 80. For example, the advanced boards will allow the PS/2's main CPU — an Intel Corp. 80286 or 80386 microprocessor — to off-load routine, time-consuming I/O tasks to concurrent processors in order to increase throughput and performance.

When the necessary multitasking software interfaces become available, these boards will reportedly allow a PS/2 to accommodate multiple operating systems, including AT&T's Unix, without significant performance loss. "You could conceivably have Unix and [Microsoft Corp.'s] MS-DOS in the same machine just by dropping in a processor board," said Bob Kutnick, director of strategic projects at AST Research.

A 68000 processor board could easily interface to IBM's global bus by adding "the logic required to make the 68000 bus talk with the Micro Channel bus," said Jim Reinhart, manager of applications engineering for the 68000 series in Motorola, Inc.'s semiconductor product sector in Austin, Texas.

Revelation expected next week

The first of these multiple processor cards is expected to be announced next Monday by AST at a press conference in New York. The firm plans to unveil an enhanced hard disk controller board with its own microprocessor that will handle multiple disk requests simultaneously. The company would not specify which microprocessor would be featured on the board.

By early 1988, a new generation of add-in cards is expected to unfold with a focus on enhancing networking, graphics processing and multiuser applications on the PS/2. "When you drop in a processor card, you get double the throughput without the burden of software overhead," Kutnick said.

Unlike previous IBM Personal Computer AT bus structures, the Micro Channel architecture features a Multi-Device Arbitration interface with the ability to support up to 15 "arbitrating devices." These devices, according to the Micro Channel specifications manual, can range from "intelligent subsystems" to "concurrently operating processors."

"To visualize the power of this feature," wrote Micro Channel architect Chet Heath in a recent technical journal, "consider a 'spreadsheet engine' where seven concurrent processors are added to the system processor and the application separates the spreadsheet matrix and portions out pieces to each of the eight processors."

Heath and other Micro Channel architects were not available for comment.

Cumulus will lean toward the multiuser environment with its initial board offerings, said Martin Alpert, president of the Cleveland-based start-up. He said Cumulus multiprocessor boards will begin to appear within six to eight months.

Such boards will be "helpful in network environments and in hanging dumb terminals off a [PS/2] Model 60 or 80," said Bill Berkman, product manager for Orchid Technology in Fremont, Calif. "They would also be helpful in super number-crunching environments."

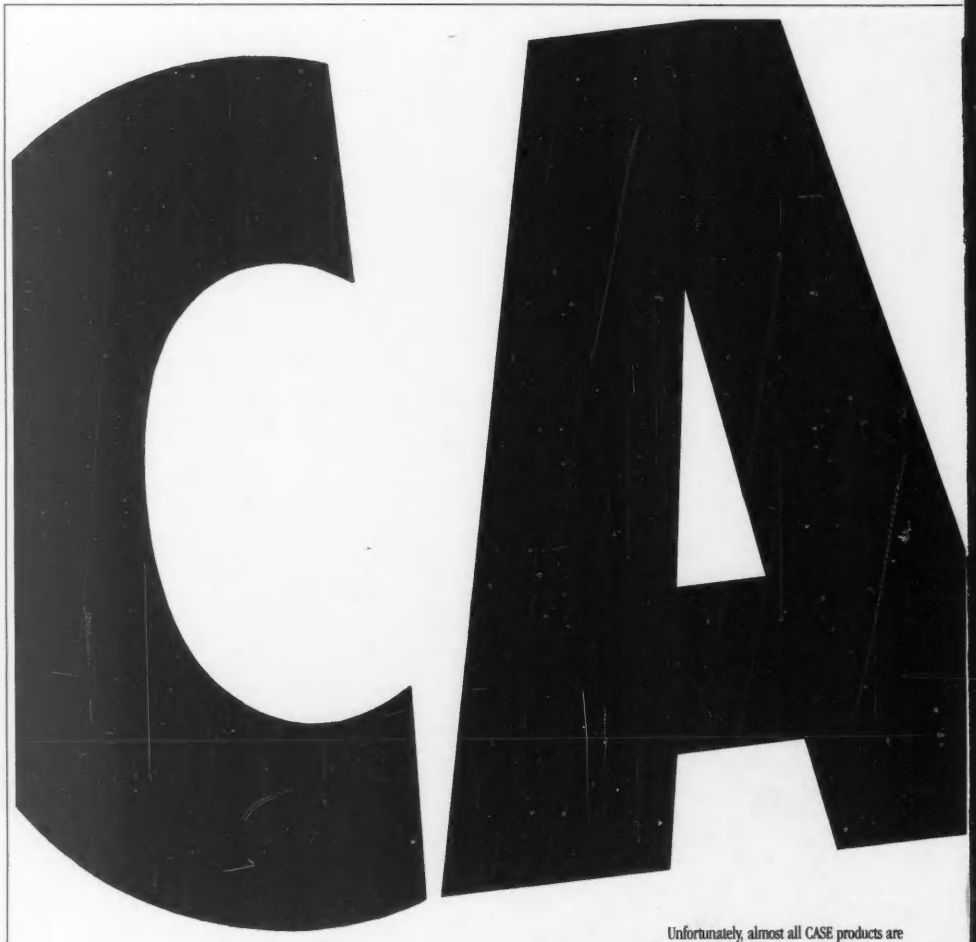
However, developers said, software availability and cost factors could hinder the success, at least initially, of concurrent processing boards.

"With some of these boards, it will be almost like buying a separate computer, with retail costs around $1,100 to $1,500," Berkman said.

In addition, software programs that bring the full capabilities of the Micro Channel architecture's concurrent processing environment are not expected for at least a year, sources said.

In order to run Unix and MS-DOS or OS/2 operating systems on the same machine, for example, a software interface is required. "The real difficulty is in getting the two operating systems to cooperate, not the processors," Motorola's Reinhart said. "The board vendors or a third-party software vendor looking for a good new market would have to build an interface between the operating systems."

There are some hardware limitations as well, according to Bill Jennings, a Quadram design engineer. "The logic on the Micro Channel determines which board takes the next turn on the bus," Jennings said. "Then a particular coprocessor gets the bus for less than 14 msec and has to give it up. There are some things that only the motherboard can have access to, like video, direct-memory access and the like. But the Micro Channel does not let another processor take control of the bus indefinitely."



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IBM nixes midway 4381 upgrade

RYE BROOK, N.Y. — IBM last week announced that it will refrain from marketing packages that would upgrade its original 4381 models to second-generation models. The packages were to take effect Dec. 15.

The company said sales representatives began notifying customers on Sept. 15 that the upgrades would be discontinued in three months.

The move eliminates upgrades from the original 4381 Model Groups 1, 2 and 3 to the 4381 Model Groups 12, 13 and 14, which were announced in February, 1986.

However, the company said the discontinuance actually only eliminates a middle step in the 4381 upgrade path, because users of Models 1, 2 and 3 can still upgrade their systems to IBM's latest models — the 4381 Model Groups 22, 23 and 24. These model groups were announced in May for delivery in early 1988.

An IBM spokeswoman said the interim upgrades were discontinued because there had not been strong customer requirements.

The announcement does not impact upgrades from the second-generation systems — Model Groups 11, 12, 13 and 14 — to the 20 series models.

PS/2 clone kits in the pipeline

BY ALAN J. RYAN
CW STAFF

IRVINE, Calif. — Western Digital Corp. officials last week said that firm now has tools that will allow OEMs to put IBM PS/2-compatible clones on dealer shelves by early next summer.

At the announcement of nearly 20 Personal System/2-compatible products, many of which will be used in PS/2-compatible motherboards, Collier Buffington, vice-president of strategic business development, said the company did not clone IBM's PS/2 components but instead provided cost-efficient parts compatible with the PS/2 line.

Most significant at the announcement, according to analysts, were Western Digital's core-logic chip sets. One is compatible with the PS/2 Models 25 and 30, and a second chip set is compatible with the PS/2 Models 50 and 60.

The company said the FE2011 core-logic chip for the PS/2 Model 25 and 30 design integrates the functions of the PS/2 Model 30 CPU core logic into a single chip. The FE2011 was developed by Faraday Electronics, a Western Digital company. It will be available to OEMs by the end of the year.

Chipping away

"In a single chip, we've incorporated all the logic you would have found in the complete motherboard of an IBM PC in 1981," Buffington said. "By comparison with the Model 25 or 30, it took IBM 21 chips, and it took us just one."

John Wardley, a senior analyst in the workstations research group at International Data Corp. in Framingham, Mass., said the products will further the development of PS/2 clones. "If there are a lot of manufacturers interested in cloning the Model 25 and 30, it seems like there are a lot of pieces in place for them."

Amy Wohl, president of Bala Cynwyd, Pa.-based Wohl Associates, said that while she believes there will be an entire clone market arranged around the PS/2, "the Model 50 and 60 are the products I expect will do well with clone manufacturers." Wohl said her firm is doing a survey on IBM customers' buying intentions and that to date, it indicates most of the activity will center on the Models 50 and 60. "I'm not sure building Model 25 and 30 clones will be a big market," she said.

Western Digital officials would not comment on which companies are currently working with the chips to develop PS/2-compatible products. "We have a number of customers actively working on PS/2-compatible products," said Edward Marinaro, executive vice-president and chief operating officer.

For the PS/2 Model 50 and 60 designs, Western Digital announced the FE5400 core-logic chip set, which is said to offer designers the capability to build system boards compatible with PS/2 Models 50 and 60 using highly integrated, 20-MHz low-power CMOS devices. Western Digital said the chip set provides all the necessary core logic to build a totally integrated PS/2 Model 50- or 60-compatible motherboard using the 16-bit Intel Corp. 80286 CPU.

The chip set directly interfaces to the bus and meets all Micro Channel bus timing specifications, the company said.

The set is expected to be available during the first quarter of 1988.

SE

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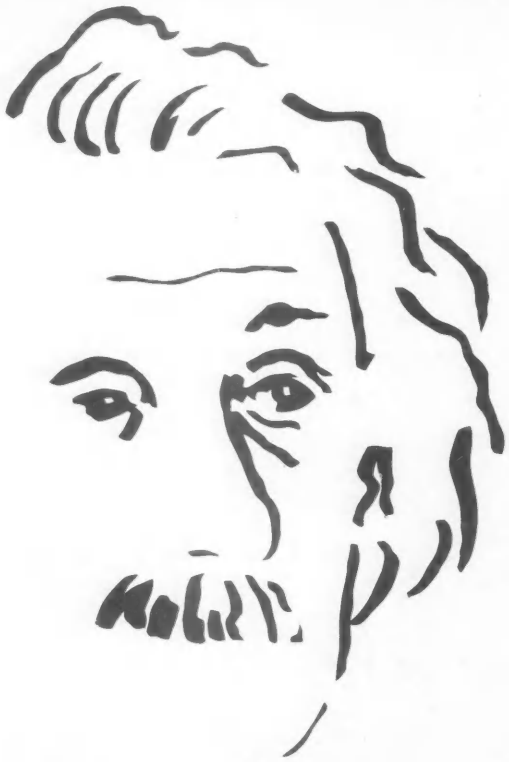

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Borland joins Mac alliance, updates Reflex

BY STEPHEN JONES
CW STAFF

SCOTTS VALLEY, Calif. — Borland International last week announced plans for a major push into the Macintosh marketplace that will include joint development and marketing deals with Apple Computer, Inc.

Borland's Reflex Plus, a $279 relational data base released last week, is the first Macintosh product to be comarketed with Apple. The two companies are gearing up for a major joint promotion of Reflex Plus through dealer channels, according to Ronald Posner, executive vice-president of sales for Borland.

Products jointly developed by Borland and Apple will focus on desktop communications software for the Macintosh, an area increasingly emphasized by Apple. Such products are likely to feature networking and connectivity for multiuser systems.

Posner said the first package to come out of the venture will be similar to Borland's upcoming Sidekick Plus, a powerful microcomputer desktop organizer. The Macintosh product will run on a network and incorporate many of the features of Sidekick Plus, such as an automatic appointment scheduler.

The package will be available during the first half of 1988, but Posner would not discuss pricing.

Posner predicted the alliance strategy will help boost Borland's Macintosh software sales to 20% of total revenue within one year. Mac products currently bring in about 10% of Borland's total revenue.

Pushing the right buttons

"Desktop communications has become a new hot button for Apple — it's an important enough marketplace that you can make some real money," Posner said.

Borland is one of several microcomputer software developers that are jumping on the Macintosh bandwagon. Spurred by a burgeoning market for Macintosh software and increasing demand for graphics-based programs, companies such as Lotus Development Corp. and Wordperfect Corp. have recently announced new products for the Mac.

"It's a very logical step for Borland," said Charlotte Walker, a senior vice-president with L. F. Rothschild & Co. in New York. "Just as IBM mainframe software developers started shifting their products to Digital Equipment Corp.'s VAX, PC software companies are realizing that it behooves them not to be tied to any single platform."

But Mac software from Borland is nothing new.

Borland claimed to have shipped 125,000 units of Macintosh software since 1985 for such products as Turbo Pascal, Reflex and Sidekick. The company said it is currently shipping 2,000 copies per month of the initial Reflex version.

Posner has brought all Mac development at Borland under one division, which he will head for the next year before appointing a permanent general manager.

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The A1, A4 & A6 are the youngest and smallest members of the respected Unisys family of A Series mainframes. The series includes machines that run major banks, governments, schools, hospitals and businesses all over the world. An independent survey of mainframe owners found Unisys systems scored the highest five year average in overall satisfaction.*

While Smallframes are about the size and price of minis, the top of the A Series isn't a set of minicomputers playing together. It's the A15, one of the largest and most powerful true mainframes money can buy.

Between the A15 and the A1, there are 12 other models.

Computerworld, June 15, 1987, survey by Datapro Research Corporation.

All compatible over the line—and over time. Software written for any model or generation over the last 17 years is compatible with any current A Series model.

Since all three are built for the same size cabinet, the A1 itself is field upgradeable to A4 and A6 levels—a better than 3 times increase in computing power.

Doesn't cost much.

You already know the A1 gives you mainframe quality for about the price of a mini.

But what about the rest of the A Series? From the moment of conception, every computer in the family is designed to be easy to get along with and cost very little to run.

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Grandpa's eyes.

All in all, the best thing about the Smallframe is that it sees the world the same way the powerful A15 and the whole A Series does. You might even call it a "chip off the ol' box." It's got the same operating system. Same interfaces. And it will even communicate with IBM machines.

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EDITORIAL

Pre-presenting...

Recently, we conducted a roundtable interview with the leaders of the three giants in microcomputer software: Edward Esber of Ashton-Tate, James Manzi of Lotus and William Gates of Microsoft. The results will be published Nov. 2. One issue debated at the roundtable — product announcement and delivery policies — is of particular interest to MIS. This has been addressed in past editorials, and our view is that lengthy gaps between announcement and delivery are suspect at best and debilitating to planning efforts at worst.

To some extent, the differences of opinion expressed underscore an escalating sense of competition. Microsoft was resoundingly scored when it was several quarters late in delivering its Windows operating environment. But Gates drew a distinction between preannouncing systems software and applications, saying that customers need the directional readings given from preannouncements of systems products.

Manzi drew no such distinction. And to prove his point, Lotus announced last week a 1-2-3 for Apple's Macintosh to counter Microsoft's imminent announcement of its Excel spreadsheet product for IBM and compatible PCs. Excel for the IBM PC begins shipping this quarter, while 1-2-3 for the Mac will arrive late next year.

Esber said he doesn't like the smell of preannouncements at all, but is forced to play the game by the likes of Lotus and IBM.

Whatever policies these and other key vendors adopt, it is clear that users benefit little, if at all, from lengthy product preannouncements. The operative word here is responsibility, and vendors have a duty to show it in word and deed.

Editor's note

Computerworld's Sept. 7 issue featured one of the most comprehensive MIS salary surveys ever conducted.

Last week, another publication featured its proprietary salary survey, and some of our readers may note discrepancies between the salaries listed in their study and ours. Perhaps it is best to list some of the differences in methodologies so that readers may understand how these discrepancies might have arisen.

CW's survey tallied results from more than 1,400 MIS professionals, or 21% of the 7,000 questionnaires sent out to a prequalified group. The other survey was based on fewer than 600 questionnaires garnered from 10,000 that were mailed, or a 6% return.

In addition, our 1,400 returns were used to compute average salaries in 24 categories, giving us categories with as many as 850 responses — a valid statistical sample. The other survey listed 47 categories but did not print the number of actual responses in any individual category, as the CW survey did.

We are refining our methodology and do not claim our figures are perfect; we do maintain, however, that there is safety in numbers.

LETTERS TO THE EDITOR

Focus elsewhere

It was disappointing to read that Wang Laboratories, Inc. has severed its last connection to South Africa [CW, June 8], thereby joining the campaign for disinvestment at the same time we rush to extend loans and credits to and expand trade, including high-tech, with the Soviet Union.

While South Africa's racial sins (like our own) are scarlet, that country has not adopted as the ruling ideology the century's most odious form of tyranny over the mind of man; it is not conducting the decade's most monstrous crime in Afghanistan; it has not converted its territory into a staging area for the export of Communist revolution; and it has not aligned itself with a regime that has 9,000 ballistic missle warheads pointed at the U.S.

South Africa has never sought to be an enemy of the American people. In two World Wars and Korea, that country's soldiers fought alongside ours. When American pilots attacked the terrorist base camps in Libya, South Africa was almost alone among the nations of the world to applaud our action.

What have the people of South Africa done to us that we are now anxious to collude with the most despotic regimes on earth in waging economic war against them? One wonders exactly which country on that continent South Africa should emulate.

American computer manufacturers are falling over themselves, fighting technological trade barriers and hoping to be the first and biggest supplier to the land that has no freedom of speech, religion, press or movement. Why no campaign for disinvestment in the Soviet Union, whose legions are conducting nothing less than a campaign of genocide in Afghanistan?

Maybe Wang has some software to prove a citizen of the Soviet Union is no worse off than blacks in South Africa, but I doubt it. Its lack of logic does not compute.

Daniel John Sobieski
Chicago

Stick to issues

The following concerns a recent letter from E. F. Codd [CW, Aug. 10].

For the record, I have been a user of Pick Systems' Pick operating system for more than five years, and I have personally developed tens of thousands of lines of code in its primary programming language. I have been a member of the Association for Computing Machinery for an even longer period, and, through the association's publications, I am familiar with prior and ongoing research in data base management systems.

The word "relational" has become as degraded in meaning as the term "user friendly," and for the same reason — marketing. While the Pick operating system is a powerful operating system, it is not a relational data base system by Codd's definition (and it cannot be doubted that, as the originator of the concept, he has the right to establish that definition).

The Pick system is a data base management operating system. It can be used as a vehicle for implementing DBMSs of any kind, including network, hierarchical, relational and object-oriented, but it is not based explicitly on any of these models.

For data base management, the Pick system supports files and dictionaries of attributes associated with files. It is access-method independent in that, while conventional hashing is typically used to access file items, there is no application code defining that access method, and that method can be changed without changes to the application.

The only level of schema supported by the Pick system is the internal schema (supported in the dictionary). Conceptual and external schemas are implemented by applications running under the Pick system, not by the system itself.

It is this feature that makes it possible to implement the DBMS of one's choice on top of the Pick system's file system. While reports can be generated with attributes drawn from multiple files using correlatives stored as dictionary entries, updates to joined files must be handled by application code.

In short, while the Pick system is an outstanding tool for the practitioner, theoretically it breaks no new ground.

Unfortunately, many Pick users are purely practitioners, completely unaware of the various research topics that have been explored in the last 15 years. As a consequence, they have been known to make extravagant statements as to the nature of the powerful tools the Pick system provides.

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Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

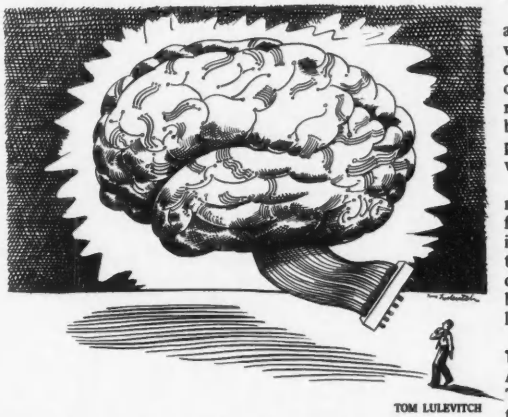
Mind machines over matter

Neural networking processors strive to emulate the workings of the brain

HARVEY NEWQUIST

Neural networks are the latest in a series of computer advances that purport to bring us the newest (and thus the best) style of computing. Never mind that you haven't even got around to the previous (and thus outdated) forms of computing — fault-tolerant, symbolic, parallel, cubic and hypercubic — because neural networks are going to help machines do things that were previously believed impossible.

Neural networks emulate the structure of the human brain. Tongue-in-cheek philosophy aside, neural networks are basically hardware configurations that work on the same principle that the brain is alleged to work on. Processors are viewed as brain cells (neurons) that are connected to many other processors via intricate networking structures modeled on dendritic and synaptic connections.



TOM LULEVITCH

The basic premise is that this network of neurons allows greater access to the information stored throughout the network on all of the nodes in it. Taking this line of reasoning further, if a network segment is damaged, the remainder of the network can work around the fault through other connective paths instead of being roadblocked. This problem circumvention is partly achieved because the neural networks do not separate memory from function. Thus, all information is stored in and throughout the entire network, not in single address spaces. The potential for incredible processing power and speed in such an architecture is mind-boggling.

The first company to accomplish anything with neural networks was TRW, Inc., which introduced a neural computer last year. There are now a dozen neural network companies on the market, almost all of them formed since the beginning of this year.

Prior to this new corporate effort to sell mind machines, almost all of the neural network interest, discussion and research was performed at a few universities, particularly the California Institue of Technology, Johns Hopkins and Carnegie-Mellon.

Actually, the concept of neural networks has been around for a few decades and has been known by a series of names, the most notable being perceptrons. MIT's artificial intelligence pioneer Marvin Minsky effectively destroyed the perceptron research and development movement with a book entitled, *The Perceptron*. Essentially, he argued that research and government funding of such machines was a waste of time.

However, neural networks refused to stay dead. The current resurgence is turning the concept into a number of forms of commercial products.

Nestor, Inc., the first neural network company and the only publicly held one, offers a software product that emulates neural construction on personal computers. The package acts as a template, making the PC think that it is a true neural network. Nestor markets its product for applications in pattern recognition, especially for situations that utilize handwriting, as with checks and insurance forms.

Synaptics, Inc. is designing very large-scale integration semiconductors based on neural connections.

Currently, the most prominent company, and one of the newest, is Hecht-Nielsen Neurocomputers. The company was founded by the leader of TRW's research team and offers an IBM Personal Computer AT coprocessor board called ANZA, which emulates 30,000 neurons. The card is currently bundled with Zenith Electronics Corp. PCs for a total price of $15,000.

One of the most interesting phenomena of almost every neural network company is that it has as a founder or board member some luminary in the field. The reason this is of special note is that every one of these individuals — and there are only about 15 of the them — espouses a different approach to the concept of neural networking. Their philosophies range from modeling the new machines on connections to the human eye to physically structuring the intangible storage compartments of the mind.

Not only do these different approaches make for an industry without a defined set of standards, but they leave potential customers with a bewildering array of concepts to contemplate before even considering what purpose the machines will serve within the company.

Because they model the human brain, neural networks are a fabulous new technology. This idea underlines the approach taken by a number of the neural companies. You get a computer built like a brain, it should work like a brain, right?

Thinking about thinking

Actually, the reverse is true. Throughout history, man has tried to figure out how his mind works — by using his mind. This effort has proven inadequate, because using something to define itself is not easy. And too much thinking about thinking has destroyed a lot of very inventive brains.

Man has always turned to the outside world to define his mind. Without exception, the most recent technological advances have been used as a model for the brain. In Plato's time, when wax had replaced stone as the most useful writing material, the philosopher theorized that the mind was essentially a substance similar to wax, upon which thoughts and images were pressed.

In Hippocrates' era, the reigning technology was based on water or hydraulics. And man tried to explain the brain and its functions in terms of liquid flow and wave movements inside the skull.

As man progressed out of the dark ages of alchemy, it was believed that the mind was simply a product of chemical reactions oc-

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Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Pricing multiuser software accordingly

EFREM MALLACH

My colleague Bob is in charge of a conversion project. He has to move about one hundred programs written in an obscure PDP-11 language, plus several hundred megabytes of data, to a VAX.

Since the Digital Equipment Corp. VAX supports a more-or-less compatible version of the language, and the file structures are simple, it was estimated that the task would take five people about a year to accomplish.

"Five people for a year" requires some structure, so Bob looked for a project management package. He found a good one that ran on his VAX. Then he called for the price.

One minute later, Bob hung up the phone and was rethinking his choice. Why? His system, a Vaxcluster with two 8500s, has the potential to support more than 100 users.

That was that

The project management package was priced accordingly — in five figures. Bob was the only person who would ever touch it, but that didn't matter. A license for two clustered 8500s came with a certain price tag, and that was that.

Bob signed up for time on his department's personal computer, bought a PC project management package for $500 and has used it happily ever since.

Who are the winners and losers here?

- The PC project management software vendor wins. It sells one more copy of the package.
- The PC vendor wins a little. PC use in Bob's firm went up. It is a step closer to buying another.
- DEC loses a little. An application is running on somebody else's hardware. Bob is becoming comfortable with a PC, not a VAX. He may opt for the PC the next time, as well.
- Bob is a small loser. The VAX package was more capable than the PC package he bought, but not that much more capable.
- The VAX project management software vendor looks like a loser but may not be. The company lost a sale, but it didn't lose a $14,000 sale.

Bob was never a $14,000 prospect. At most, he was a $1,000 prospect.

To make this $1,000 sale, the vendor would incur most of the same costs it incurs when 50 people will use the package. If the firm is set up to serve large users, Bob might cost them more than he is worth.

Yet the world is full of Bobs. Many firms have one person who does statistics, one who designs pages, one who draws floor plans. These firms buy multiuser computers from DEC, Prime Computer, Inc. and others.

People want to use multiuser systems. They are faster than PCs, they are on an electronic mail network, they store the divisional data base. Yet they are forced to use PCs because software packages for multiuser systems are priced as if everyone on the system were using them.

Is there a way out of this dilemma? Yes.

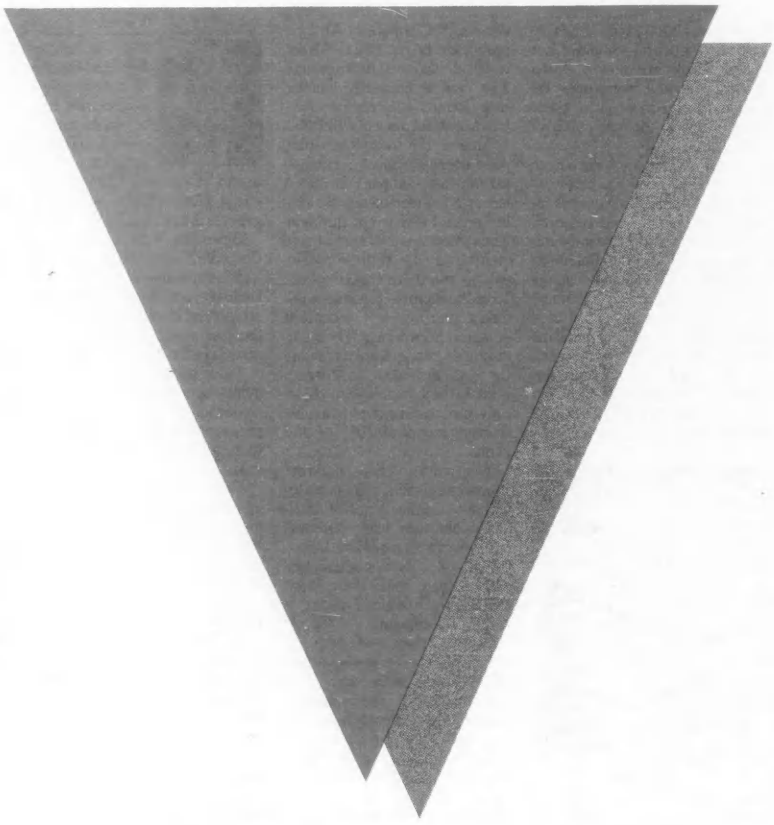
- Package developers should release versions that restrict the number of users. There are several ways to enforce such a restriction, including an honor system, which seems to work reasonably well with unprotected PC software.
- The distribution system must evolve to handle personal-use software, much as it now handles PC software. A package developer can give its outlets master tapes plus documentation at, say, $375 a set. The outlets could then retail the package for $650 or $750.

Now who wins? Bob, who gets the package he really wants on the machine he wants to use. DEC, which gets the application back on the VAX. The package developer, who nets several hundred thousand dollars from a few dozen new wholesale customers.

Who loses? The PC software firms, which will sell fewer copies, and PC manufacturers, because an application isn't running on a PC. But today, they enjoy a market that is artificially supported because multiuser software isn't distributed through the most ideal channels. PCs have enough strengths and suitable applications to not need this crutch.

PEOPLE are forced to use PCs because software packages for multiuser systems are priced as if everyone on the system were using them.

Mallach teaches at the Boston College School of Management and is a consultant to top user and vendor executives. Much of his consulting work involves systems selection and competitive analysis.



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Mind machines

CONTINUED FROM PAGE 23

curring within the confines of the brain.

This way of thought continued to modern times. In the early part of this century, the intricate workings of the mind were thought to be similar to the complex interconnections and networkings of the phone system.

In the 1950s, the vacuum tube computer was the best example of how the brain utilized heat and electricity to create thought.

Now, in the age of microprocessors, it is believed that if hundreds of thousands of them are put together in the right configuration, a realistic model of the brain will result.

Where will neural networks end up down the road? Probably as a viable technology. Right now, though, there is still a lot of theory, as opposed to market need, driving the concepts. There are some good recognition applications, but they aren't pervasive.

I've seen some very impressive examples of a neural network being able to identify handwriting and turn it into computer text. It's an arduous process, but it does happen.

On the other hand, the machine did not "learn" to identify handwriting; it utilized program functions and lines of code to identify certain letters as having specific values. No magic there, just elaborate and highly efficient computer science at work.

Continued from page 22

However, I would remind Codd that the Pick system is in use at tens of thousands of sites, that millions of lines of code have been written to support the applications at those sites and that the same operating system and applications can run on hardware from various manufacturers.

No tool is perfect, and the excitement in our field comes from the diversity of ideas about the way things should be done.

Thoughtless statements or attacks only make it more difficult for us to get on with the real issues of computing.

Mark Cashman
DP Manager
Anocoil Corp.
Rockville, Conn.

Legal language

One of the points made in "Computer crime law: A capitalist tool?" [CW, Aug. 31] referred to the language of the California Penal Code, Section 502.

This computer crime law was one of the first to be drafted, and such interpretations are possible. This issue of clarity and intent has been a major impetus in revising that penal code section. California State Senator Ed Davis's bill, Senate Bill 255, will clear up much of that problem.

In particular, denial of use of computer services to an authorized user is called out, specifically, as a public offense.

Also, the amount of victim expenditure to verify altered, damaged, deleted or destroyed systems, programs, networks or data will be used to help determine punishment.

Of course, those of us working in the risk analysis and evaluation business would like to see the business value of computer services also denied as part of the package. This refers to the dollars denied or delayed to the business or other user due to the denial of computer services. Nevertheless, Senate Bill 255 looks like a big improvement over other versions, and it could become law at year's end.

As for the rights of the users, I do not see a computer crime issue involved there; it is rather an issue of breach of contract. It makes no difference to me whether a bank destroys my financial records by erasing a data file or by burning a sheet of paper from a ledger book that was written with a quill pen drawn from an inkwell.

Edwin B. Heinlein
Heinlein Associates, Inc.
San Rafael, Calif.

Nice job

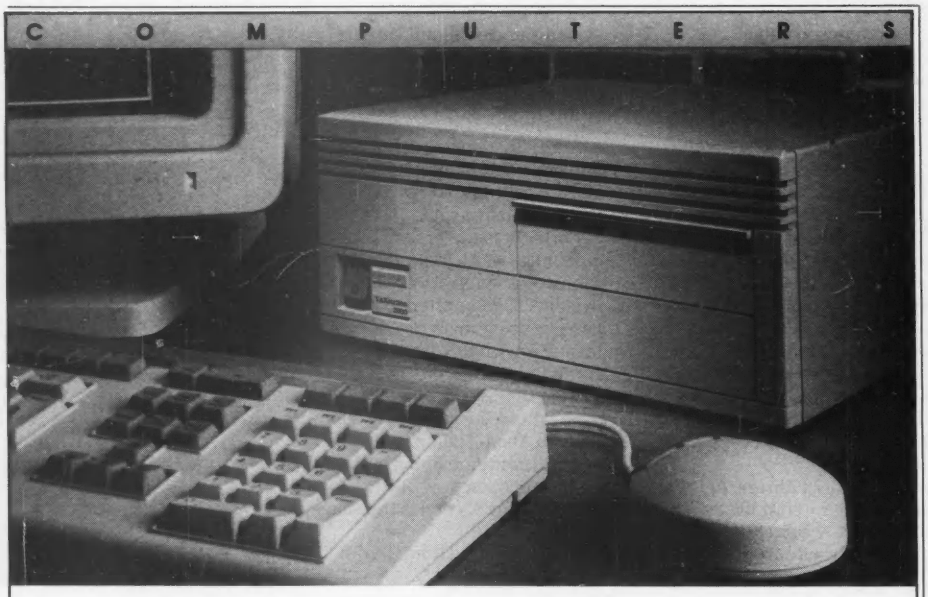
Alan F. Westin's " 'We, the people' in the computer age" [CW, Sept. 14] was a brilliant and insightful treatise on the societal impact of information technology. On a subject that often gets more heat than light, Westin should be commended for his even-handed analysis.

Jack Bologna
Computer Protection Systems, Inc.
Plymouth, Mich.

This week in history

Oct. 10, 1977
The Soviet Academy of Medical Science is using computerized profile sheets in its search for settlers to inhabit Siberia. Although the area is rich in natural resources that require people to develop them, half of the Soviet workers who move to Siberia cannot take the harsh weather conditions and leave within three years.

Oct. 11, 1982
Computers at the Food and Drug Administration have sorted and stored the results of nearly two million tests conducted last week on Extra-Strength Tylenol capsules, following the deaths of seven people in the Chicago area who consumed similar capsules laced with cyanide.



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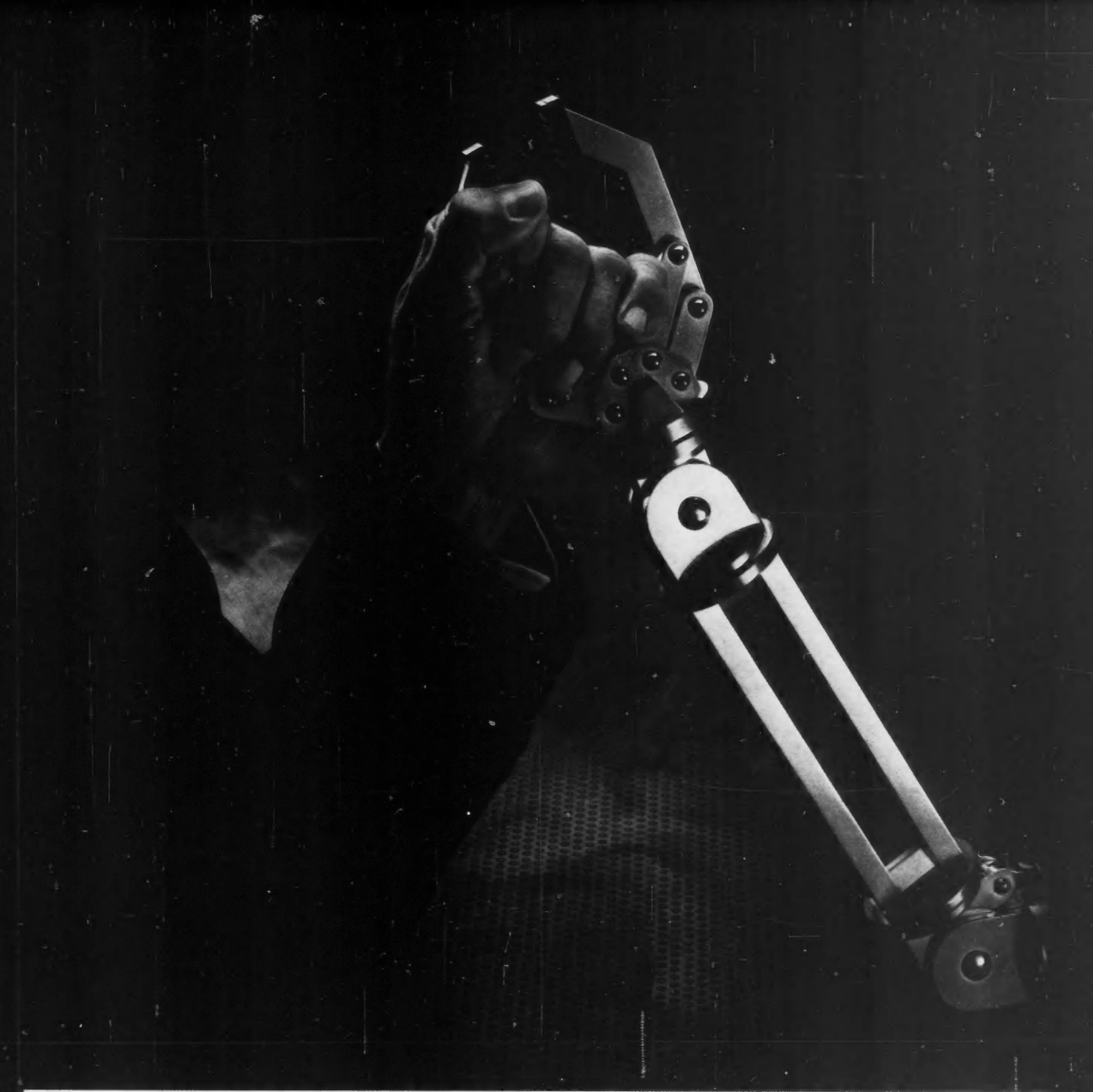

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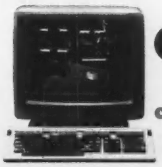

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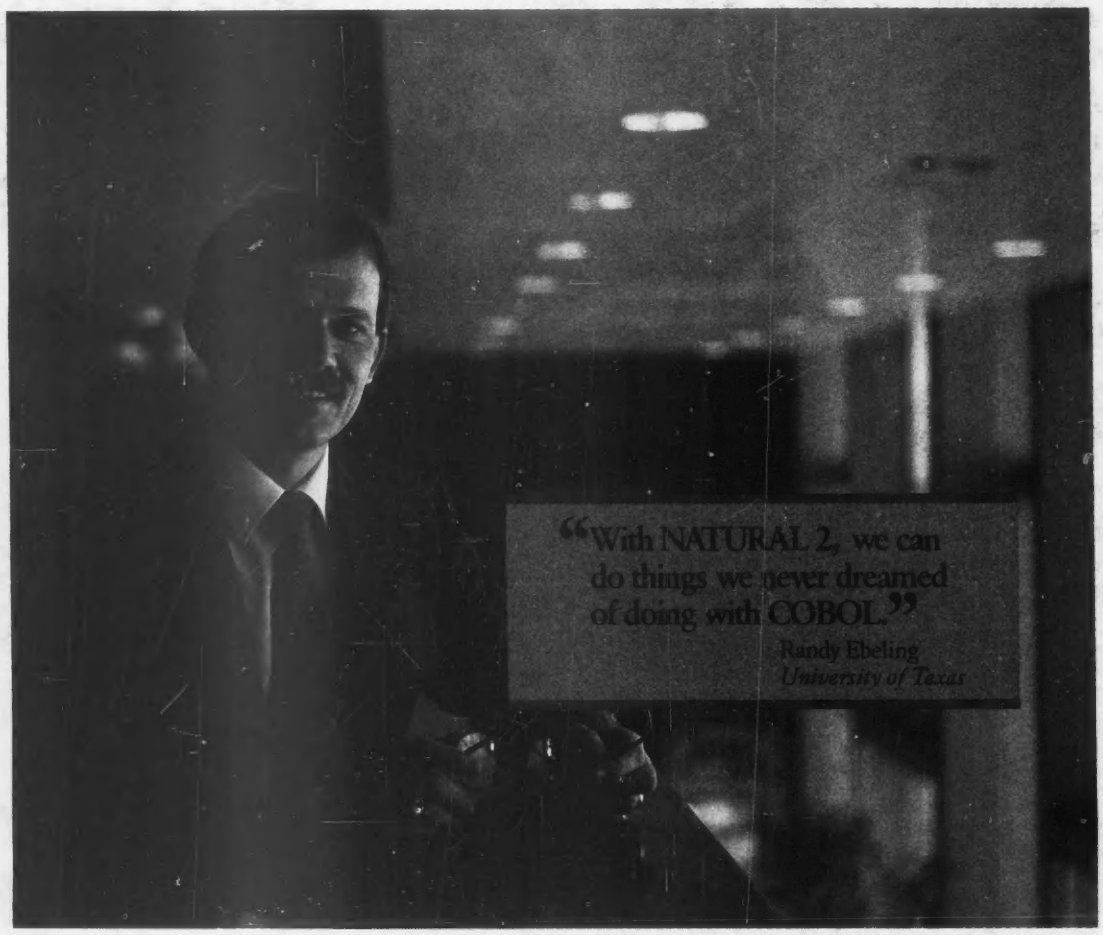

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Steven Pfrenzinger

Craft a CASE methodology

The successful use of computer-aided software engineering (CASE) tools is dependent on having a methodology that governs the steps of the software life cycle. Below, I have highlighted the important characteristics of a CASE methodology that address this issue:

- A successful CASE methodology would have to systematically control and integrate the tools, methods and procedures that are used throughout the software life cycle, including maintenance.
- Incremental prototyping would certainly be the foundation of the CASE methodology. In a radical departure from traditional methodologies, it would be used during the entire software life cycle to define, enhance and exercise system components.
- The familiar phases would still exist, but they would overlap to a substantial degree and would have due dates very close to one another. The blurring of distinctions between phases would occur as construction of software became the incremental building and testing of sys-

Continued on page 40

ADR wins Army SQL contract

Outguns large, entrenched competitors for $13 million DBMS project

BY CHARLES BABCOCK
CW STAFF

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) was recently awarded a contract to provide the U.S. Army with 75,000 copies of an SQL-based personal computer product, giving ADR and an allied company, Software Systems Technology, Inc., a chance to emerge as players in the relational data base market, according to industry observers.

The contract, estimated to be worth $13 million over a 10-year period, will provide the Army with an end-user data base management system for use under Unix and Microsoft Corp.'s MS-DOS and Xenix at standard Army data processing sites.

ADR was chosen as the prime contractor after a four-month competition that included more established relational vendors such as Oracle Corp., Relational Technology, Inc., Informix Software, Inc. and Unify Corp.

ANSI-standard SQL

The procurement is one of the first in which the SQL data access and manipulation language was used as a specification in bidding for a government contract, said Richard Finkelstein, manager of the Codd and Date Consulting Group's Chicago office. The SQL to be provided will be ANSI-standard, with extensions that match IBM's use of the language with its DB2 product, ADR officials said.

The core of ADR's bid was the XDB DBMS developed by Software Systems, a small firm headed by Bing Yao in College Park, Md. ADR purchased the source code to XDB in February. The system is noted for its user friendliness and its SQL parser, Finkelstein said.

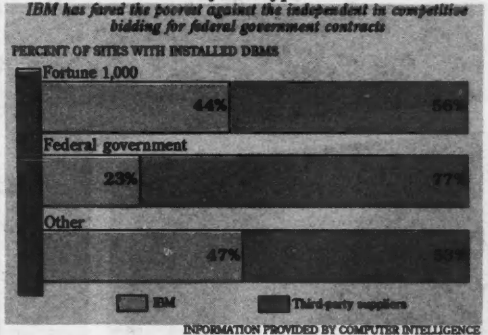
ADR and Software Systems teamed up on the bid, with ADR acting as the prime contractor and Software Systems as a subcontractor. ADR will provide management and support during the life of the contract, and its partner will provide the system.

Continued on page 36

Data View

IBM vs. independents: DBMS market share by site type

IBM has fared the poorest against the independent in competitive bidding for federal government contracts



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

Distributed DP woes aired

BY ALAN J. RYAN
CW STAFF

NEW YORK — Info '87 attendees interested in distributed processing raised concerns about obtaining real-time operation and maintaining data integrity in a distributed environment during a recent panel session here.

John Collins of Macmillan, Inc., based here, commented that employees at his firm make law journal entries at distributed workstations, which are periodically contacted by a host main-

Continued on page 36

Centralized control tool out on CICS

BY ALAN ALPER
CW STAFF

NEW YORK — On-Line Software International, Inc. recently introduced a utility it said enables operators to monitor up to 35 local and 35 remote CICS regions from a single console.

The utility, CICS Central, is the first product on the market to provide centralized control of CICS systems, said Denise Barnett, product marketing manager in the Fort Lee, N.J., systems house's Productivity Tools division.

CICS Central helps operators increase productivity by giving them full control over CICS operations management and VTAM network management at one location. Operators no longer have to monitor separate screens for each CICS region and can respond more quickly to critical messages, the firm said.

CICS Central can also be programmed to filter out less impor-

Continued on page 40

Inside

- DEC add-on tailors All-In-1 for executives. Page 32.
- Execucom upgrades business graphics package. Page 32.
- Data/Ware upgrades Pal-Plus programming language. Page 44.

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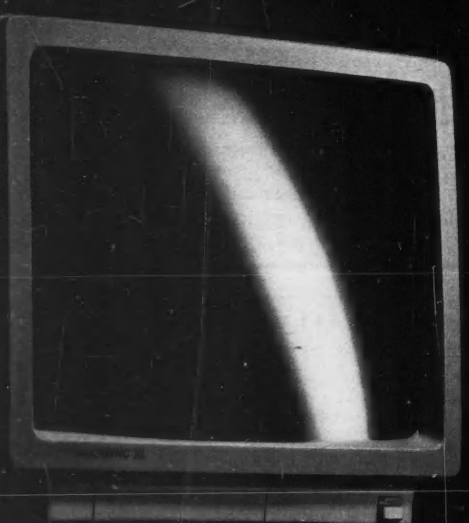

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DEC tool streamlines All-In-1 for execs' use

BY SUZANNE WEIXEL
CW STAFF

MERRIMACK, N.H. — Digital Equipment Corp. recently introduced an add-on software product said to tailor its All-In-1 office information system to run in executive offices.

Designed to streamline executive office administrative tasks by providing immediate access to information without disrupting work flow, the All-In-1 System for Executive Services (SES), which is layered with DEC's All-In-1 on any VAX computer, was originally developed for DEC's internal use.

Ann Jenkins, secretary to DEC President Ken Olsen, said the product development team worked alongside her to determine the four or five specific functions needed to run an executive office more efficiently. Features include an interrupt capability that allows users to move around within the system and return to their original tasks without impacting the original task, the ability to share information among the entire staff and the ability for a user to act as the system administrator, needing data center support only for such functions as software updates.

According to Jenkins, who has been using various prototypes of All-In-1 SES for about 18 months, the product provides administrative support personnel with key office functions. It gives an office staff "the ability to work as a team, using the same information at the same time. . . . It also allows us to work quickly. I am not a patient person, and I do not want to keep someone holding on the phone while I spend time tracking an inquiry."

All-In-1 SES includes a log-management and tracking system that records, references and searches information about telephone communications, correspondence, customer inquiries, documents for signature and specific customers. It also provides an office directory, scheduling capabilities for resources and personal calendars.

File-sharing capabilities allow users other than a file's creator to access a document for editing, reading or printing. Since the user has system administrator capabilities, security levels can be assigned at any time on an individual basis.

The product comes with technical service as well as on-the-job training and support. According to Jenkins, the procedural nature of the documentation helped ensure that her office was up and running the day after installation. "The system is menu-driven, and the same keystrokes are used in each function, so you only have to learn it once," she said.

Slated for delivery in early October, All-In-1 SES costs $15,000.

"... probably the best book on the subject ... well-written, well-organized ... The author's style is a refreshing change from what one usually finds in computer science texts."
—Eastgate Systems

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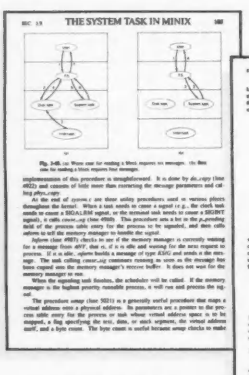
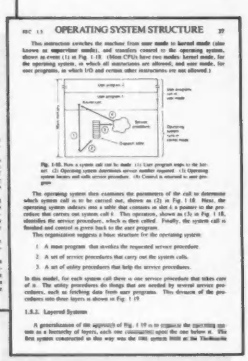
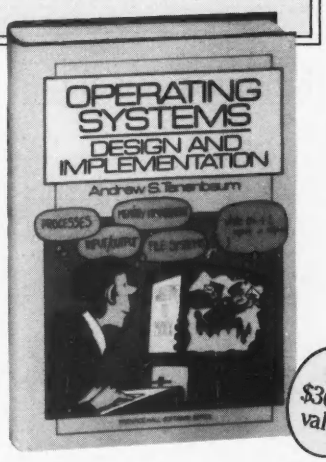




SAMPLE PAGES



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Computerworld 10/12/87 7-DV8

Graphics revamp adds fonts, ease

AUSTIN, Texas — Execucom Systems Corp. is shipping a new release of its business graphics package that is said to let users do more advanced design work and more easily construct graphics from symbol libraries and use varying type sizes.

Impressionist Release 2.0 has additional text fonts and a function that allows users to edit those fonts by changing their sizes or shapes, the company said.

Data and text table formats have been added to this release. It now has a 98-color palette from which users can select colors. A symbols library has been added to allow users to call up standard symbols and put them into charts or graphs.

Runs the gamut

Impressionist 2.0 runs on mainframes, minicomputers and microcomputers. It also comes with additional device support for plotters and printers. Additionally, the microcomputer version will no longer be copy-protected, Execucom said.

The software is offered as a standalone system; it can also work with other Execucom products, such as the company's Interactive Financial Planning System, a business planning package.

The micro version will work with other vendors' software as well, such as Lotus Development Corp.'s 1-2-3, the company said.

Licensing

Execucom claims to have sold 1,500 microcomputer licenses and approximately 100 mainframe licenses for Impressionist since 1985.

For the mainframe environment, Release 2.0 ranges in price from $15,000 to $55,000, depending on processor size.

It runs under IBM's MVS and VM operating systems. Upgrades from Release 1.0 are included as part of maintenance agreements.

A license for the minicomputer version, designed for both Digital Equipment Corp. and Prime Computer, Inc. platforms, starts at $9,000.

The microcomputer version, which runs on IBM Personal Computer XTs, ATs or compatibles, costs $695 through the end of this month. Beginning Nov. 1, it will cost $995.

Current microcomputer users will be charged $195 to upgrade to Release 2.0 this month. The subsequent upgrade charge will be $295.

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VAX remote access device out

TOPSFIELD, Mass. — Software Partners/32, Inc. recently released a remote device access system designed for Digital Equipment Corp.'s VAX/VMS.

Crossnet is said to replace the need for remote tape drives and to aid management of remote data from the main site. Using DEC's Decnet, Crossnet transfers data from remote VAX nodes to and from a tape drive on a host system in the context of any standard VMS I/O format, including backup.

According to company spokesmen, when Crossnet forms a link between the two nodes, it creates a logical name on the local node that appears as a specified disk or tape drive on the remote node. I/O requests on the local node are made to the new logical entity, and the requests are passed over Decnet to the remote node for processing. Data and status information is returned to the local node.

Crossnet can be used in conjunction with the vendor's Tapesys tape library management system to schedule and drive complete backups of unattended remote disks from a central host site, according to the vendor.

Crossnet is available immediately. It costs $3,000 for one host and one remote node. Each additional node costs $500, the vendor said.

Distributed DP

CONTINUED FROM PAGE 29

frame for updates.

Collins said he found an excess of polling from the host, "which results in a lot of overhead." The polling ties up a telecommunications line and requires mainframe CPU cycles.

Speaking at the Info '87 session, "Distributed Data Processing," John P. Birch, corporate vice-president of distributed data processing at McCormack & Dodge Corp. in Natick, Mass., said polling is expensive in both CPU time and communications line rental. But, he added, most companies that implement distributed systems do not need to provide constant access to the host.

Most users think they need to synchronize data between the host and the workstations at all times, Birch said, but this approach is often unnecessary and expensive.

"Users can do high-speed batch transmissions of the information at the end of the day, and it's a lot cheaper. The most expensive thing is on-line processing during the prime shift," Birch said. M&D incorporated the end-of-day, batch update approach in two distributed products it introduced last summer.

Not for everyone

While batch transmission is a viable solution in some instances, it is not the answer for everyone.

One user, who works in shop floor project engineering management for a large computer company, said his work in distributed DP demands that his terminals are in synchronization with the host.

"It's hard to do it in real-time," he said. "We often want to access things in real-time, but we cannot always be sure that it's the real data."

"The degree of effective planning and control required for a distributed application can be significantly higher than that required for centralized or decentralized systems," said Robert Walsh, vice-president of the Boston Systems Group, Inc. Users' responsibilities must be explicitly defined rather than left open-ended, he added.

Another concern is maintaining the integrity of the data base.

An example cited by Birch was a price list set at a company's headquarters and distributed to a chain of stores. Because changes in the list can only be entered at headquarters, the integrity of the list is maintained.

But many people seek distributed systems to process local data, which is then used to update a central host, the users noted. In that case, controls must be imposed regarding who can update which data if integrity is to be maintained, the speakers acknowledged.

Army contract

CONTINUED FROM PAGE 29

"There are two new guys on the block. These are two companies that have to be contended with in the marketplace," Finkelstein said, noting ADR's recent commitment to providing an SQL engine for its mainframe Datacom/DB.

The September issue of *Software Digest* described XDB as one of the best relational products available on a microcomputer. "If you don't have at least a bachelor's degree in computer science or several years data base design experience, buy XDB," the magazine's "Ratings Report" said.

The system can use direct SQL commands and also offers a menu-driven, IBM Query-by-Example-type interface. With the latter method, the user enters search criteria, and the system automatically generates SQL statements.

In addition to the relational DBMS, ADR will provide the Army with a menu generator, a forms generator, a high-level procedure language for applications development and an applications programming interface, said Daniel A. Urban, director of technology support for ADR's Federal Operations Group.

What's the Score in T3 Fiber-Optic Channel Extension?

1		
2		
3		Yes
4		Yes
5	Is the vendor's equipment transparent to your operating system and application software?	Yes
6	Does the vendor's equipment include redundant power supplies for maximum reliability?	Yes
7	Is the vendor able to provide an integrated computer switching and channel extension system?	Yes
8	Can the vendor support various transmission options, such as single-mode and multi-mode fiber over long and short distances, and T3 links?	Yes
9	Does the vendor have its own nationwide service organization?	Yes
10	Are the vendor's channel extenders complemented by a *complete line* of Data Path Management products, including computer matrix switching, data communications matrix switching, and performance measurement systems?	Yes

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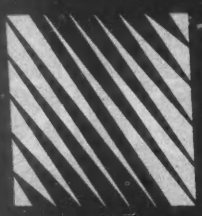

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For network solutions, you should be seeing red.

Control tool

CONTINUED FROM PAGE 29

tant user-defined messages or to alert operators to critical situations. Data center managers can color-code various types of CICS and VTAM messages or can distinguish among types by using highlighting on monochrome screens, according to On-Line officials.

"This is important because there can be up to 14,000 messages per hour on heavily used MVS systems," Barnett said.

Any authorized CICS terminal can be used as a central console to display CICS messages from other CICS regions, On-Line said. Messages are stored until an authorized party erases them. The product contains a batch facility that lets data center managers print out customized reports of daily operations.

Using CICS Central, operators can issue authorized VTAM and CEMT commands, the latter of which are used to scrutinize activity in CICS. Operators can also issue preprogrammed command lists to any CICS region.

The utility is compatible with all CICS security packages on the market, according to Barnett.

Currently available, CICS Central is being offered for a monthly fee, which includes service and support. For OS systems, the package costs $750 per month. For DOS/VSE systems, it costs $500 per month.

Craft a CASE

CONTINUED FROM PAGE 29

tem prototypes.

- A standard work breakdown would be used to define the various tasks and deliverables. The role of the analyst in these tasks and deliverables would be expanded, and the role of programmer would be diminished, especially as CASE tools continue to automate more of the programming functions.
- A CASE methodology should clearly indicate what categories of CASE tools would be used, when they would be used and who would use them — currently a major problem.
- Development of the requirements would occur simultaneously with, rather than before, development of software. Development could begin with basic requirements, but the specs would not be done until the system was complete.
- A CASE methodology would promote incremental prototyping as a team science rather than as an individual art. This team concept during prototyping sessions would require easy-to-understand procedures that could be taught quickly and easily to end users and MIS personnel. Active user participation would also be promoted.

A CASE methodology should clearly indicate what categories of CASE tools would be used, when they would be used and who would use them — currently a major problem.

- While CASE tool vendors might become suppliers of CASE methodologies that promote their products, the most successful ones would be generic frameworks that could use a whole category of tools rather than a specific vendor's tool. Such methodologies would describe what is to be done without being specific as to how to accomplish it.
- Use and development of reusable components would be a major theme in any CASE methodology. Reusable component libraries can already provide up to 80% of most new applications.
- Early error detection and a dedication to building the right system the first time would also be important themes.

CASE tools are making it possible for prototyping to be used during the design, development and maintenance phases. While there are many categories of CASE tools available today, the most significant are PC-based graphics tools for analysis and design and PC- and mainframe-based applications generators for development.

Life cycle coverage is now possible because these design tools have developed interfaces with code generators to automatically pass along screen and report designs, data definitions, edit logic and other design-level information without having to manually re-enter data or recode in a different language.

Relational data base management systems, with their fast and flexible data definition capabilities, are allowing early prototypes to include realistic file access and updates.

Interpretive execution of program source code that can later be compiled is also allowing prototypes to include realistic file access and updates. Interpretive execution of source code to be compiled later is also allowing prototypes to be changed, and the concept of interpretive prototyping will have a major impact on development productivity in the future.

A CASE methodology using CASE tools to support incremental prototyping during the entire software life cycle can help the software industry reach its objectives of greater productivity, higher quality and better maintainability.

Pfrenzinger is president of Information Management Systems Consulting, Inc., a Northridge, Calif.-based firm specializing in IBM's IMS DB/DC, CICS and DL/1.

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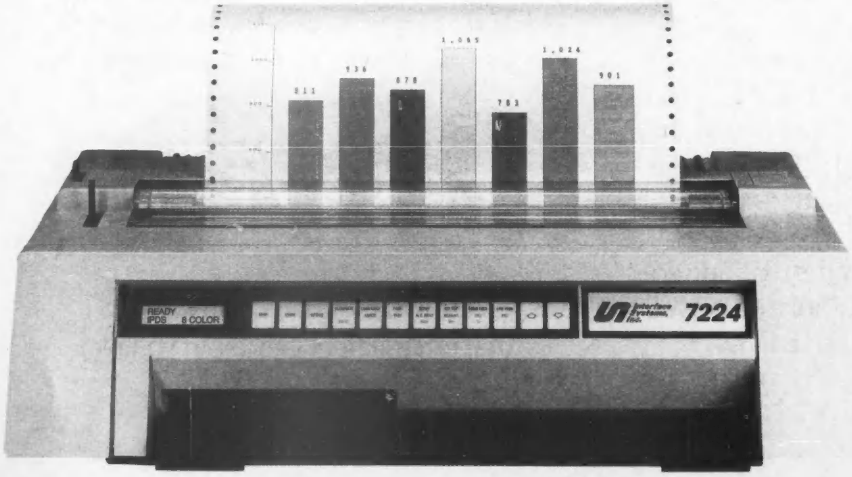

KnowledgeWare announces two new *CASE* tools

1 New ***Planning Workbench*** helps link systems plans to business strategy

Includes:

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- Decomposition Diagram tool for showing planning objects that have hierarchical associations
- Entity Diagram tool for describing high level entities

2 New ***Design Workbench*** makes process and data design faster and easier

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- Data Structure tool for data declarations, records, relations, segments, and screens
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NEW PRODUCTS

Systems software

A dynamic pooling and data set allocation control system has been announced by **Empact Software, Inc.**

Called **Pool/DASD**, the system allows an installation to define pools of direct-access storage device (DASD) without modifying the eligible device table and without JCL changes to existing procedures. It also provides the installation with control over the size of allocation and the attributes of the data set. It supports all types of data set organization and device types, the vendor said.

Other features include the ability to add volumes to pools dynamically and to identify volumes that are fragmented or short of free space.

Pool/DASD runs on IBM mainframes under MVS. Prices range from $4,500 to $12,500.

Empact Software, 1275 Parker Road, Conyers, Ga. 30207. 404-483-8852.

Applications packages

The **Tekcase** family of computer-aided software engineering (CASE) tools has been introduced by **Tektronix, Inc.**

Tekcase products include the Analyst/RT, for structured analyses of real-time systems, the Designer, a structured design tool for software systems, and the Auditor, a documentation and traceability tool for designers complying with U.S. Department of Defense STD-2167 requirements. The products are available on the Digital Equipment Corp. family of VAX computers.

Prices range from $3,600 to $54,000.

Tektronix, P.O. Box 14752, Portland, Ore. 97214. 503-629-1573.

Release 2.0 of **Slim**, a metrics-based tool designed to help software developers plan and manage large projects, has been announced by **Quantitative Software Management, Inc.**

Release 2.0 offers customized milestones, enhanced life cycle and reliability functions, design-to-size and design-to-peak-manpower functions.

The Reliability section now allows the user to specify the number of hours, days, weeks or months the system will have to run, then find the point in the development at which that requirement is met. In the life cycle function, users can make staff and cash flow plans for the entire development.

Slim runs on IBM Personal Computers and compatibles. An annual license costs $35,000 for the first site.

Quantitative Software, 1057 Waverly Way, McLean, Va. 22101. 703-790-0055.

A pension-management software package for IBM mainframes has been announced by **Integral Systems, Inc.**

The package, called the **Pension Benefit Administration Systems** (PBAS), is said to meet all administrative, regulatory and record-keeping requirements of the Tax Reform Act of 1986. It is composed of recordkeeping and pension-projection subsystems and makes all pension information available through interactive screens.

The product reportedly performs such calculations as projected social security benefits, retirement benefits at various ages, different joint and survivor options and final average earnings.

PBAS is available as part of the Integral Systems human resource management information system, which is priced from $65,000 to $95,000.

Integral Systems, 2185 N. California Blvd., Walnut Creek, Calif. 94596. 415-939-3900.

Nixdorf Computer Corp. has enhanced its **Loan Management Information Systems** (LMIS) to automate aspects of consumer loan preparation.

LMIS 2.0 is a multiple data base system. Users may customize the system to incorporate requirements such as identifying loans selected for pools and Federal National Mortgage Association, better known as Fannie Mae, Schedule of Mortgages, prioritizing loans by commitment date and prioritizing secondary marketing portfolios.

Features include on-time entry of loan information, editing capabilities, a report generator and communications modules that allow transmitting information for loan servicing.

LMIS 2.0 operates on Nixdorf's 8870 business computer systems. Fees start at $130 per month.

Nixdorf, 80 Main St., N. Reading, Mass. 01864. 617-664-5781.

Languages

An implementation of the numerical-control program language specified in ANSI X3.37 has been announced by **Houtzeel Manufacturing Systems, Inc.**

The **APT System for PCs** features five-axis, three-dimensional programming. It provides single-pass processing of machine tool instructions and lets the part programmer use structured program language for conditional and repetitive statements.

The system runs on 32-bit workstations and minicomputers as well as on the IBM Personal Computer AT and compatibles. It is priced from $2,500 to $4,500.

Houtzeel, 38 Bear Hill Road, Waltham, Mass. 02154. 617-890-2811.

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Vice-President, UFO-COBOL/XE
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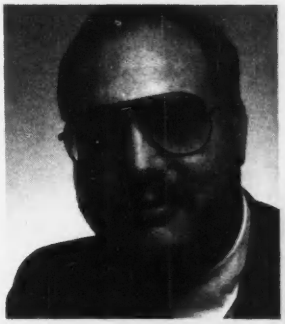
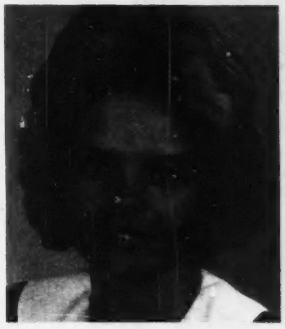


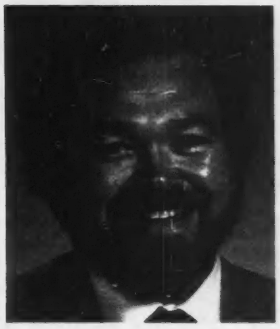
"Using UFO, we boosted productivity on the order of 80% relative to Command Level COBOL. We developed one system with UFO that employed a series of 33 integrated on-line screens in six months. We could never have developed this system under Command Level COBOL in that time period."

Priscilla Davis
National Standard
Co-Chairman, UFO-COBOL/XE
International User Group

"With very little on-line expertise on staff, we needed help fast, and we selected UFO. With UFO, two of us did in three years what we thought would take us six years with conventional on-line coding. And now, our applications are 100% on-line. All done with UFO."

Barbara Harris
University of Missouri
Treasurer, UFO-COBOL/XE
International User Group





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Ask any of the on-line experts at over 2,000 sites that are having productive experiences with UFO. Call an On-Line Software representative today, and ask for the names of users in your area who can share their UFO experiences with you. Or, to meet these on-line experts face-to-face, attend the next UFO-COBOL/XE International User Group meeting to be held October 25-28 at the Buena Vista Palace Hotel in Disney World, Orlando, Florida.

Call one of the officers, or Lisa Jones at On-Line Software, (609) 799-6300, ext. 6154 for registration information. It's an excellent meeting for sharing ideas and an easy way to learn more about increasing productivity with On-Line Software's advanced development tools.

If you want to develop efficient on-line applications as quickly as other on-line experts, try UFO. To arrange for a free 30-day trial, or to find out more about UFO Productivity System, or any of our other products, call or write On-Line Software International, Inc. Two Executive Drive, Fort Lee, New Jersey 07024. Service Bureau, OEM, and VAR programs are available.

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Utilities

Natural Language, Inc. has ported its **Datatalker** natural language interface and its companion product, the **NLI Connector**, to Apollo Computer, Inc. workstations.

NLI Datatalker allows users to access corporate data from relational data bases using standard English. It supports SQL-based relational data bases. According to the vendor, Datatalker incorporates knowledge representation and deductive reasoning. It understands the concepts and contexts of sentences.

The Datatalker is customized for specific applications through the NLI Connector.

The NLI Datatalker for Apollo systems costs from $10,000 per workstation.

Natural Language, 1786 Fifth St., Berkeley, Calif. 94710. 415-841-3500.

Reporter/1022, software designed for obtaining information from Cobol and Fortran file management systems running on Digital Equipment Corp. Decsystem-10 and 20 computers, has been announced by **Compuserve Data Technologies**, a division of Compuserve, Inc.

Reporter/1022 is a specially packaged version of the vendor's System 1022 fourth-generation language data base management system. It allows users to query their data files and generate custom reports. According to the vendor, users do not need to convert files since access to ASCII files is "as is."

Reporter/1022 allows one or two concurrent users. Prices start at $16,000.

Compuserve, 1000 Massachusetts Ave., Cambridge, Mass. 02138. 617-661-9440.

Uni-Coll Corp. has announced its **Virtual Machine Option** (VMO) for users of IBM-based time-sharing services.

The VMO is a package of computer resources, including CPU time, direct-access storage device (DASD) storage, software and communication capabilities. It is customized to the requirements of the end user and comes in a variety of sizes, beginning with a 1 million instructions per second (MIPS) configuration. It can be used under IBM's VM or MVS operating systems.

A typical 1-MIPS VMO is priced at $15,000 per month.

Uni-Coll, 3401 Market St., Philadelphia, Pa. 19104, 225-387-3890.

Version 2.1 of the **Remote Spoolprint/3X** software utility, designed to automatically transfer printed output from an IBM System/36 or 38 to remote System/36 or 38 printers, has been announced by **Broderick Data Systems.**

There is no limit to the number of active remote printing tasks on a source or target system.

Remote Spoolprint/3X Version 2.1 costs $1,800 for each System/38 and $500 for each System/36.

Broderick, P.O. Box 1829, 1575 Sassafras Drive, Mansfield, Ohio 44901. 419-522-3638.

Data/Ware Development, Inc. has upgraded its **Pal-Plus Version 4.0** programming language for its Peripheral Automatic Channel Emulator Models DW110 and DW145.

Pal-Plus is said to allow the user to run peripherals on the emulated I/O channel by executing sequences of Channel Command Words (CCW). Version 4.0 features looping on a CCW to provide repeated command operation.

The product is licensed for $5,975.

Data/Ware, 4204 Sorrento Valley Blvd., San Diego, Calif. 92121. 619-453-7660.

NEW AT INFO '87

Extend/VSE, an IBM VSE lock-file replacement system for shared direct-access storage devices (DASD), was announced by **Goal Systems International, Inc.**

Extend/VSE is said to merge multiple VSE machines into a close unit. It eliminates DASD I/O associated with lock-file processing and volume Reserve/Release.

Extend/VSE costs $7,500.

Goal Systems, 5455 N. High St., Columbus, Ohio 43214. 312-977-0077.

Sofstore, an administrative software management system, was announced by **DTSS, Inc.**

Sofstore manages the inventory, purchase, configuration and distribution of personal computer software. It runs under IBM's VM/CMS utilizing SQL/DS.

Sofstore costs $75,000.

DTSS, P.O. Box 70, Buck Rd., Hanover, N.H. 03755. 603-643-6600.

Thumbscan, Inc. announced interfaces to IBM's RACF and Computer Associates International, Inc.'s ACF2 control systems for its Thumbscan and Gordian security systems.

The Thumbscan system acquires and analyzes fingerprint data to ensure authorized access only. The Gordian system provides a correct password code allowing access to a computer system, the vendor said.

The Gordian access key costs $100. Mainframe software costs $9,500, and minicomputer software costs $5,500. Personal computer software costs $500 per device.

Thumbscan, Suite 800, Two Mid-America Plaza, Oakbrook Terrace, Ill. 60181. 312-954-2336.

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SSI allows you to postpone or eliminate the need for an upgrade to a bigger mainframe. You can get more computing power by connecting your existing CPUs or linking several smaller VM systems, rather than buying bigger iron. In many cases, you can save $500,000 or more by using SSI and multiple processors to *build* a larger machine.

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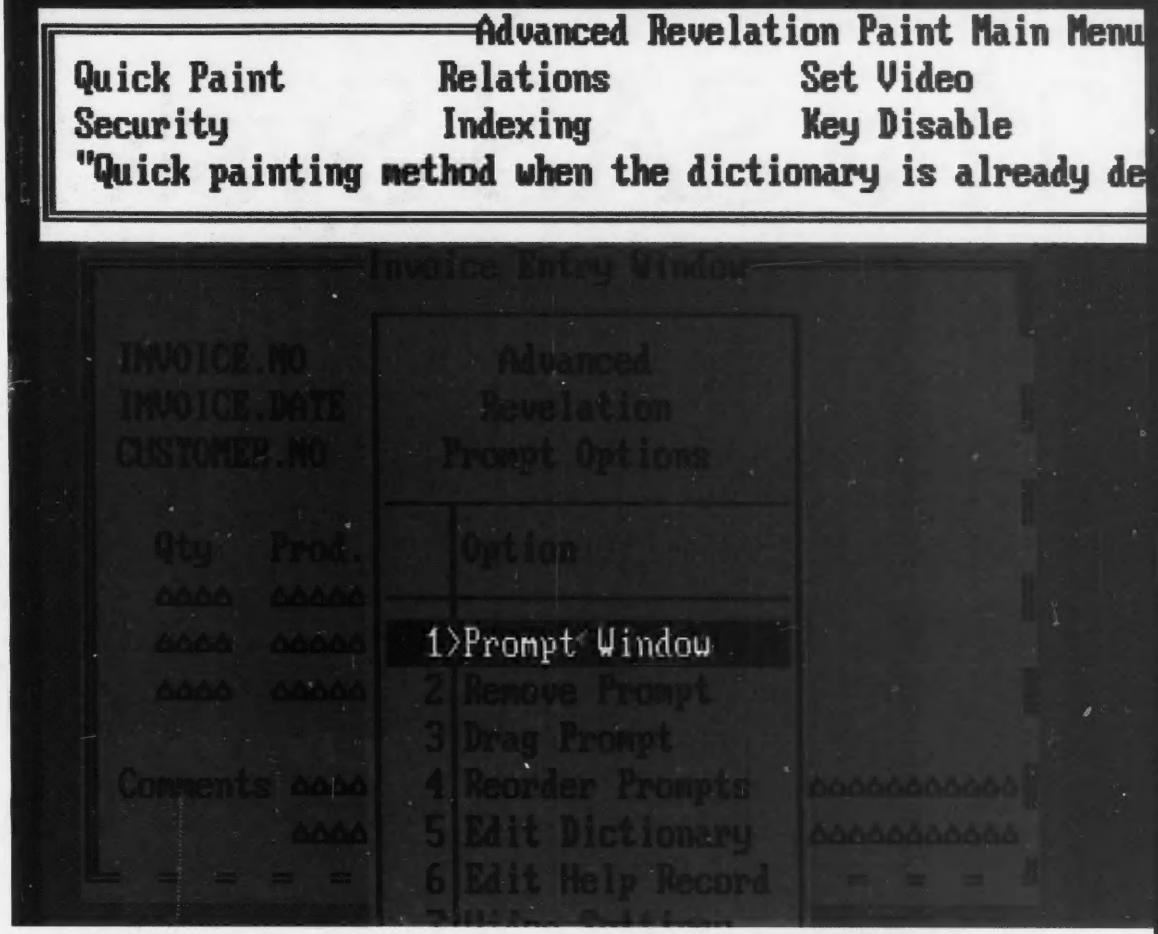

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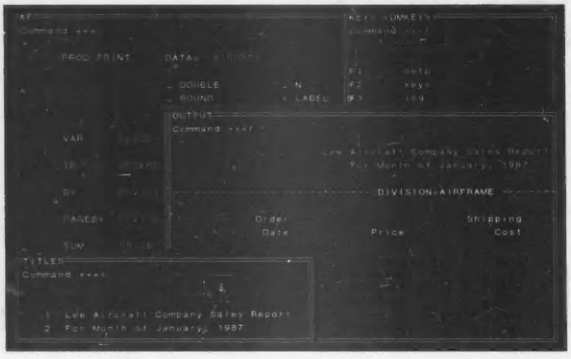
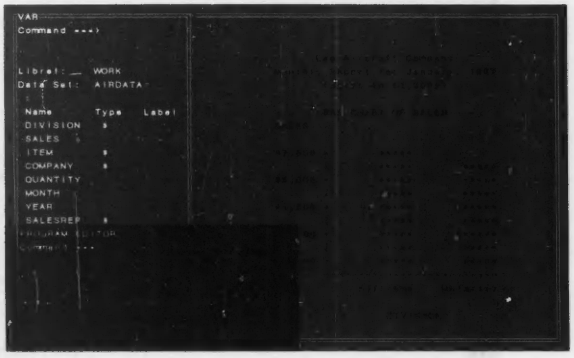


2 Connectivity. With the SAS System for personal computers, you get a built-in link to your host SAS System. You can download corporate data; develop, test, and run applications on your PC; or move data and applications back to the host for execution. Plus the SAS System reads data from any kind of file, including dBASEII,® dBASEIII,® and Lotus® 1-2-3.®

NOTE: Remote submit commencing
NOTE: DOWNLOAD IN PROGRESS FROM DATA.ACCT MONTHLY TO OUT.PC_MON
NOTE: The data set PC_MON has 500 observations and 55 variables
Data Sets Available for Download
DATA SET
DESCRIPTION
MONTHLY
Monthly general ledger balances after last close

3 Integration. The SAS System runs on mainframes, minicomputers, and personal computers. The language and the syntax are the same. The full-screen text editor is the same. You only have to learn one software system no matter what hardware your company has installed.



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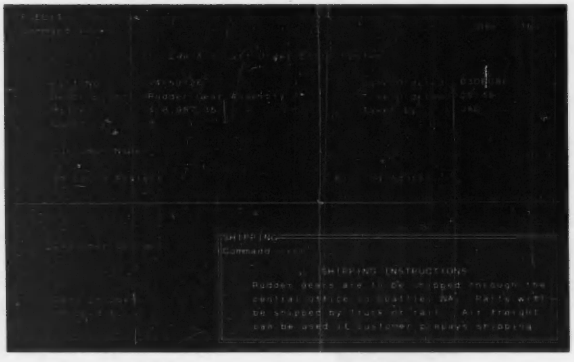

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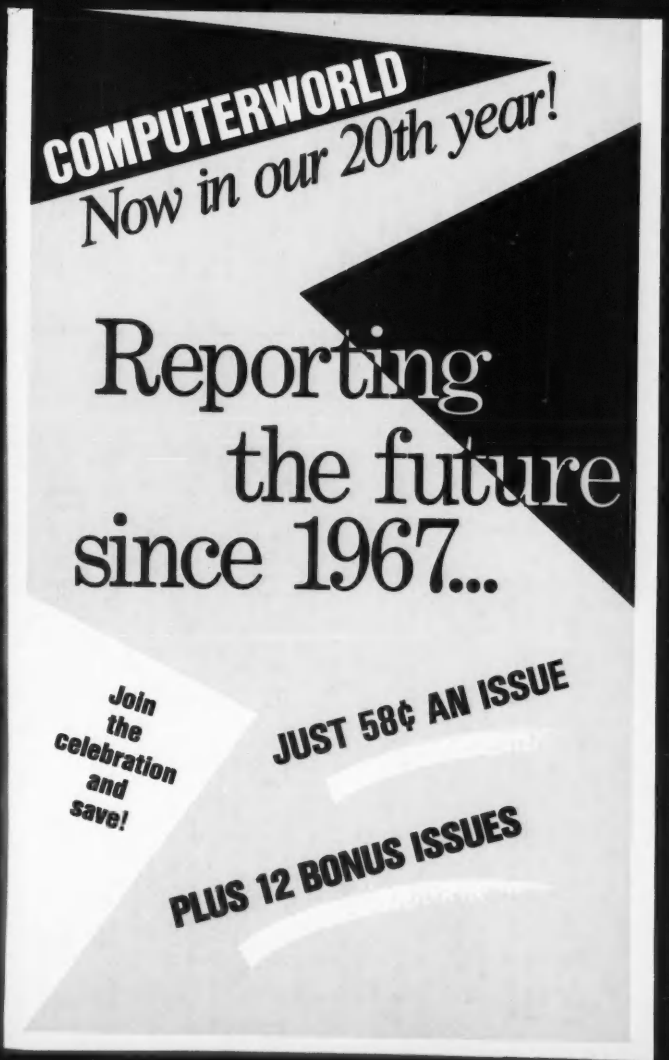
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D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

338741-2

MICRO BITS

Ed Scannell

Compaq puts pressure on

Flexing its muscles. With its first major announcements since IBM introduced its Micro Channel architecture in April, Compaq appears to have landed a pretty good left hook against Big Blue. The speed and performance of its Deskpro 386/20 series should put significant pressure on IBM in the Intel 80386 market, in which Compaq has already jumped out to a healthy lead.

As of the end of July, Compaq had sold 38,200 386-based machines through dealers, compared with IBM's 1,800, according to market researcher Storeboard, Inc. IBM's 16-MHz Model 80, however, was only released in June. But with the 20-MHz 386/20s now shipping and IBM not expected to ship its 20-MHz 386-based Personal System/2 Model 80 until later this year, that lead looks like it will only increase. Compaq President Rod Canion predicts that his firm will have a 50% share of the 80386-based PC market by this time next year.

The Flex architecture used in Compaq's 386/20s appears to be the almost-perfect counterpunch to the PS/2s'. According

Continued on page 65

Upgraded Wordstar debuts

Beta-test users cite increased speed, performance of two new versions

BY STEPHEN JONES
CW STAFF

SAN RAFAEL, Calif. — In its continuing effort to win back a huge installed base of dissatisfied users, Micropro International Corp. last week announced two versions of its Wordstar 2000 Plus word processing package.

The products were designed to leverage Micropro's installed base in specific vertical markets, such as the legal profession, in which updates of Micropro's once-popular word processing software have been almost nonexistent.

The Personal Edition of Wordstar 2000 Plus Release 3 is aimed at general-office users, while the Legal Edition was designed for legal environments. Each package costs $495, with the Personal Edition slated to ship at the end of this month and the Legal Edition scheduled for availability by the end of November.

Praise from users

Each version consists of several add-on programs bundled around the updated core of Wordstar 2000 Plus. Beta-test users said they were impressed with the increased speed and performance of the main program, praising such features as background formatting, which allows users to reformat a document while simultaneously editing a portion of the text.

Both packages run on IBM's Personal Computer and compatibles and require a minimum of 384K bytes of random-access memory (RAM), Micropro said. A total of 512K bytes of RAM is needed to run additional utility programs.

One industry watcher who saw a demonstration of the new products predicted that the add-on programs will be the big selling point for both Wordstar editions.

Most of the programs are already commercially available from their respective developers but none have been sold together with a word processor.

"Most of all, the user will notice all the bundled utility programs that come with both editions — it's like getting instant power you didn't have before," said Jeff Tarter, publisher of "The Softletter," a software industry newsletter based in Cambridge, Mass. "Micropro will make money with this thing."

However, one beta-test user complained that most of the bundled programs do not share a common interface, requiring the user to learn many separate interfaces.

One of the most notable add-on programs in the Personal Edi-

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Inside

- Large firms skeptical about needs for entry-level PS/2s. Page 49.
- Borland's Kahn explains corporate market strategy. Page 49.
- HP unveils language processor card, two vectra PC systems. Page 66.

Data View

PC world market

1986 Vendor shares by dollars

IBM	32%
Apple Computer, Inc.	10%
Hewlett-Packard Co.	6%
Compaq Computer Corp.	5%
Tandy Corp.	3%
Zenith Data Systems	3%
Unisys Corp.*	2%
Apollo Computer, Inc.	2%
Others	37%

* Unisys value combines Sperry Corp. and Burroughs Corp.

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Add-in links minis, Excel spreadsheets

BY ED SCANNELL
CW STAFF

NEW YORK — Network Innovations Corp. last week introduced connectivity software that allows data in a minicomputer to be downloaded and integrated into Microsoft Corp.'s Excel spreadsheet, which was also announced here last week.

Called Multiplex/XL, the program is an Excel add-in that directly links Excel spreadsheets with data bases residing on departmental corporate computers. The program is compatible with Digital Equipment Corp.'s VAX/VMS as well as Unix-compatible systems from AT&T and Sun Microsystems, Inc.

Users request data from a host application by entering industry-standard IBM SQL queries directly into the spreadsheet. Users can also access host data from a pull-down menu that has a list of predefined host data base requests, a company spokesman explained.

Once the query has been executed, Multiplex/XL creates an Excel document containing the query results that can be brought directly into the current spreadsheet, the spokesman said.

Network Innovations officials said they hope Multiplex/XL does for Excel what Lotus Development Corp.'s TAC does for Lotus's 1-2-3 — provide connectivity between personal spreadsheets and corporate data bases.

"For the first time, it's possible for PC users to retrieve and update one or more tables in a host data base from within a spreadsheet application," said James Groff, president and co-

Continued on page 65

IMS DB/DC on a PC? They said it couldn't be done. It's now available as an option for VS COBOL Workbench.

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CaC Computers and Communications

SMALL TALK

William Zachmann

Done with Mirrors

Were it not for a dying modem, I probably would not have chosen to write about Softklone Distributing Corp.'s Mirror II communications package. For while I am very much against the efforts of established software vendors to restrict competition through "look and feel" lawsuits, Softklone's blatant claim to be "the Crosstalk Superklone" struck me as a bit much.

I thought that Softklone, which advertises Mirror II with statements like, "You can pay more for Crosstalk XVI and get less, or you can pay less for Mirror II and get more," might have been a little more discreet. And I'd assumed that Mirror II was just a straight copy.

But a couple of weeks ago, the troubles I was having with my modem began getting worse. The modem just couldn't seem to recognize the carrier tone from an answering computer. I kept trying to reset the S9 register on the Hayes Smartmodem to a shorter time for carrier detect than the default of 0.6 seconds, but the ancient copy of Smartcom II that I use wasn't resetting the register.

I'd go onto the configuration screen, reset the time and save the parameters, but every time I got back into the Modem command mode to check, there I was, back at the 0.6-sec. default. I tried everything from restarting the program to rebooting the system. No luck.

Continued on page 61

Kahn: Ansa merger refuels Borland's tanks for Quattro's campaign into corporate market

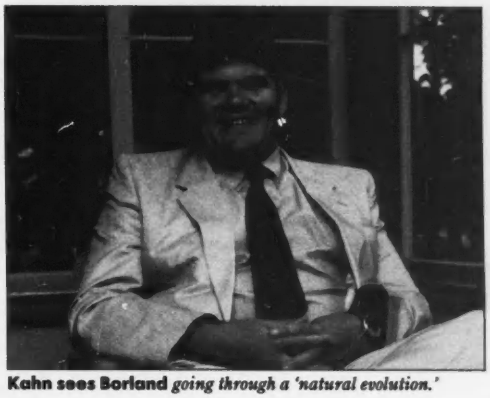
IN PERSON

Borland International has been viewed as a swaggering upstart since its inception in 1983, when it hit the ground with a handful of powerful, low-priced accessory and language personal computer software products. Earning a reputation as a maverick in the software industry, Borland was quick to spar with the likes of the venerable Microsoft Corp.

That attitude is embodied in Borland's president, Philippe Kahn, a flamboyant Frenchman who came to the U.S. four years ago and founded the Scotts Valley, Calif.-based software publisher.

Today, armed with a cache of upcoming business applications, Kahn is preparing to make a run at the corporate marketplace.

Analysts say that Borland's recently announced $195 spreadsheet, called Quattro, stands a good chance of grabbing market share away from Lotus Development Corp.'s 1-2-3.



Kahn sees Borland *going through a 'natural evolution.'*

And with the recent acquisition of Ansa Software and its Paradox data base package, Borland is readying a series of product releases aimed at dislodging Ashton-Tate's widely accepted Dbase line.

But Kahn's greatest challenge might come from within, as Borland starts to make the shift from an entrepreneurial star to a stable, well-managed public corporation. With the addition of Ansa President Ronald Posner and venture capitalist Ben Rosen as Borland directors, some speculate the maverick spirit that has made Borland great might soon be broken and tamed.

Kahn spoke with *Computerworld* West Coast correspondent Stephen Jones about his role in the transformation of Borland and the company's new thrust into corporate America.

With the addition of Ansa, will Borland be able to hold onto its freewheeling and flashy style?

I always say, "Let Microsoft be IBM, and we'll be DEC." I don't have a problem keeping an independent spirit in the light of everybody else. The only way you can develop better solutions is to keep an independent spirit. We're going to continue to pursue the best directions for our customers even if, superficially, they appear not to be exactly

Continued on page 64

Low-end PS/2s get yawns from users

BY JULIE PITTA
CW STAFF

Entry-level models of IBM's Personal System/2 line are being greeted with indifference by large corporations looking to purchase either low-cost IBM Personal Computer clones or more powerful machines for their MIS departments.

"In general, large businesses will steer away from the low-end PS/2s," said Stephen Bosley, an industry analyst for Framingham, Mass.-based International Data Corp. "IBM's telling them to."

Bosley said the shortcomings of both the Model 25 and the Model 30 serve as a message to IBM's corporate customers to concentrate their purchases on the higher end PS/2 models.

In addition, corporate users appear to be heeding that message, saying that the higher end offers a better investment for the MIS dollar because it offers increased power, increased storage and more options for expandability.

'Great for dorm room'

"Our data processing shops are already set on the Model 60," said Ron Goldfarb, manager of office automation for Pratt & Whitney Canada, Inc. "They wanted an [Intel Corp. 80286-based] machine, and they wanted as many slots as possible. The Model 25 isn't for us. If you're sending your kid off to college, it would be great for his dorm room."

"Everything we're doing is directed toward running OS/2," added Dale Preston, MIS director for Bristol-Myers Co., referring to the operating system developed by Microsoft Corp. and IBM for the PS/2. "We're standardizing on the 286 Models 50 and 60 because they offer extra computation power and graphics

Continued on page 65

PS/2 Model 30

Price: $2,995 without display

- Modular design
- Intel 8086, 8 MHz
- Two 3½-in. 720K-byte drives
- Three expansion slots

PS/2 Model 25

Price: $1,350 with built-in monochrome display $1,750 with built-in color display

- Integrated display
- Intel 8086, 8 MHz
- One 3½-in. 720K-byte drive
- Two expansion slots

Headset swings open PC doors to handicapped

Quadriplegic moves cursor with head motion, chooses characters with mouth-activated puff switch

BY ALAN J. RYAN
CW STAFF

Commercial artist Gregg Richards works from his Yuma, Colo., home creating artwork for advertisements, logos, letterheads and book jacket designs on his Apple Computer, Inc. Macintosh.

Until recently, it was nearly impossible for Richards to work in commercial art because he has been a quadriplegic since a 1979 accident.

During the past eight years, he says he has tried everything from voice-activated systems to mouth sticks to be able to work on a personal computer, but he was not satisfied. Now, Richards is using a headset from Personics Corp. in Concord, Mass. "Now, I can hold my own with anybody as far as the Macintosh goes," he says.

The Personics headset can provide a practical solution for companies that seek to hire handicapped employees and for firms that do not want to lose a valued employee after an injury or accident, according to a Personics spokesman.

"After my accident, I didn't have much of a chance to pursue art, because it is all hand work. This has opened up a new avenue for me," Richards says.

"With a mouth stick, I was unable to operate any computers that required double keystrokes," he says. Voice-activated systems proved unreliable, as well. "If I had a cold, I'd have to retrain it," because a slight difference in the voice would wreak havoc with the system, he adds.

Richards says he is optimistic that one day there will be a truly useful voice recognition system available but acknowledges that "technology has a way to go," before such a system is commercially available.

The Headmaster headset was designed originally as a mouse replacement that lets users keep their hands on the keyboard and gives them more space on their desk tops. The product was conceived by Keith Davison, a cofounder of Personics, and introduced in August 1985. In its original form, the product "didn't take off as we had hoped as a general-use mouse replacement," says Stephen Cassola, the firm's marketing manager.

However, the handicapped community expressed an interest and, during late 1985 and early 1986, Personics developed a puff switch. By moving his head, a user positions the cursor on a character represented in an on-screen keypad that takes up two lines of the monitor. By

Continued on page 65

Computerworld's Comdex/Fall '87 product preview will be published Oct. 26. To be included in this preview, written product information regarding announcements being made at Comdex must be received by Oct. 19. This information can be mailed to: New Products Editor, Computerworld, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

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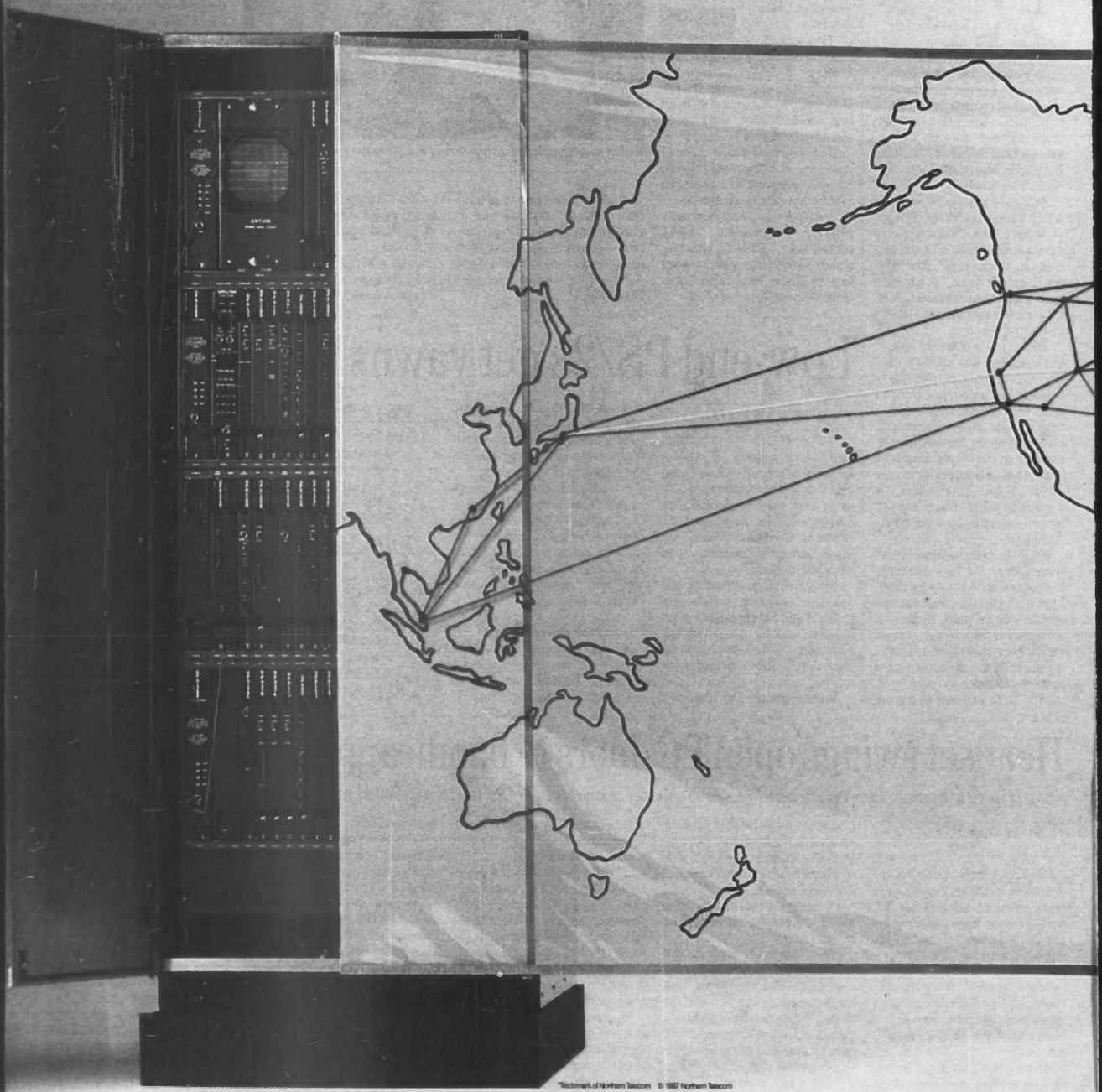

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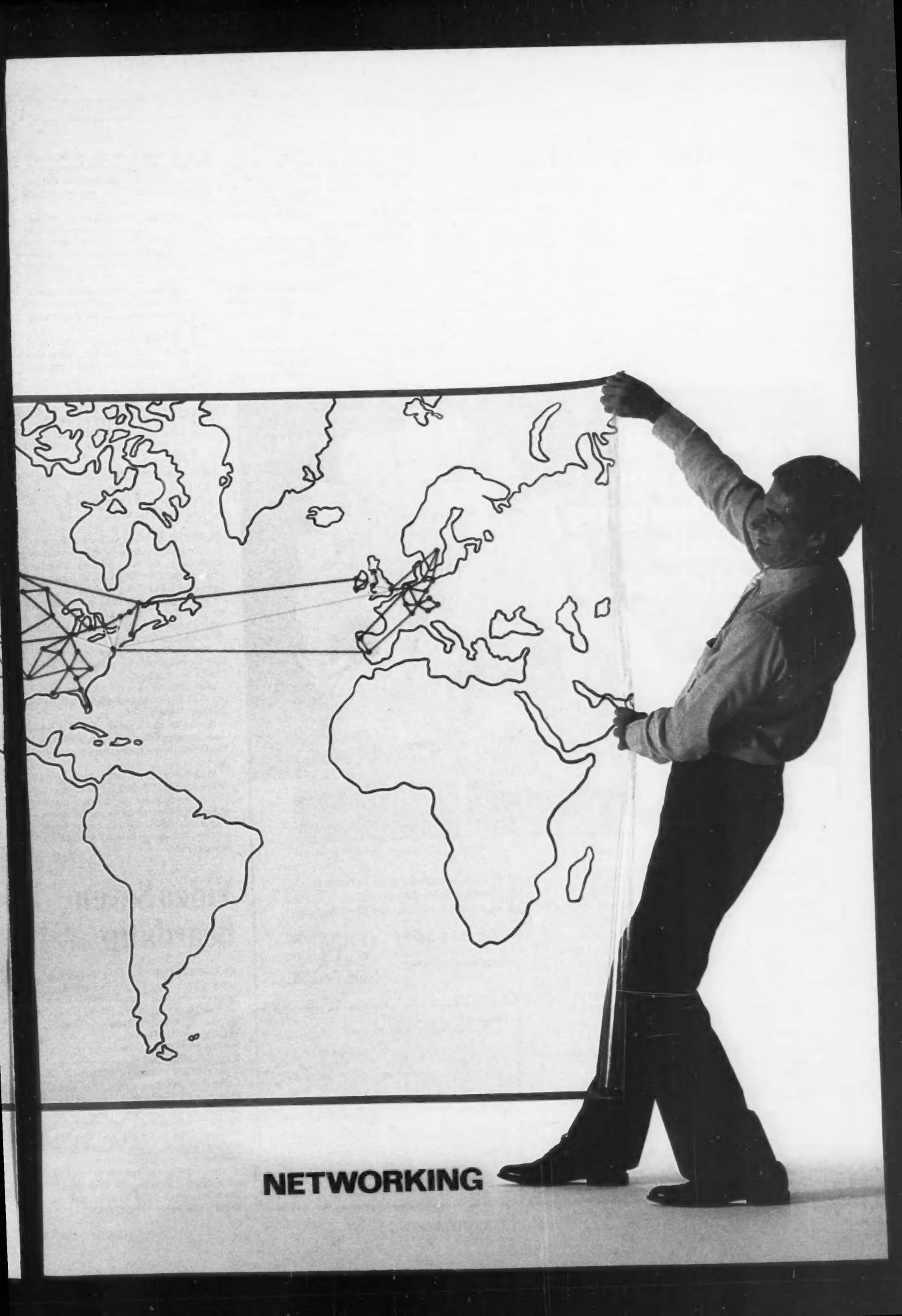

NETWORKING

Filenet opens optical access

Claims PC Connection lets users read disks, store text

BY ALAN ALPER
CW STAFF

NEW YORK — Filenet Corp. recently unveiled a series of products that allow microcomputers to access documents from its optical storage and retrieval system and a series of products to link multiple Filenet systems in a network configuration.

The Costa Mesa, Calif., firm's PC Connection gives microcomputer users access to document images stored on 12-in. optical disks in the firm's optical storage and retrieval system via an Ethernet connection. In addition, users can store microcomputer-generated data and text with document-image on the Filenet system.

"We're providing this capability for PC users who occasionally need to access documents on our system," noted Robert Castle, director of marketing operations. "This also maximizes an organization's investment in current PCs."

The PC Connection software — including a network interface and a windowing environment — is priced at $1,000. It will support IBM Personal Computer AT-class machines and Intel Corp. 80386-based micros when it becomes available in the second quarter next year, the vendor said. IBM PC XT and Personal System/2 support will also be available in the second quarter, the firm said.

Filenet recommends that customers purchase an Ethernet interface card made by Ungermann-Bass, Inc. The card lists for $1,200, Castle said.

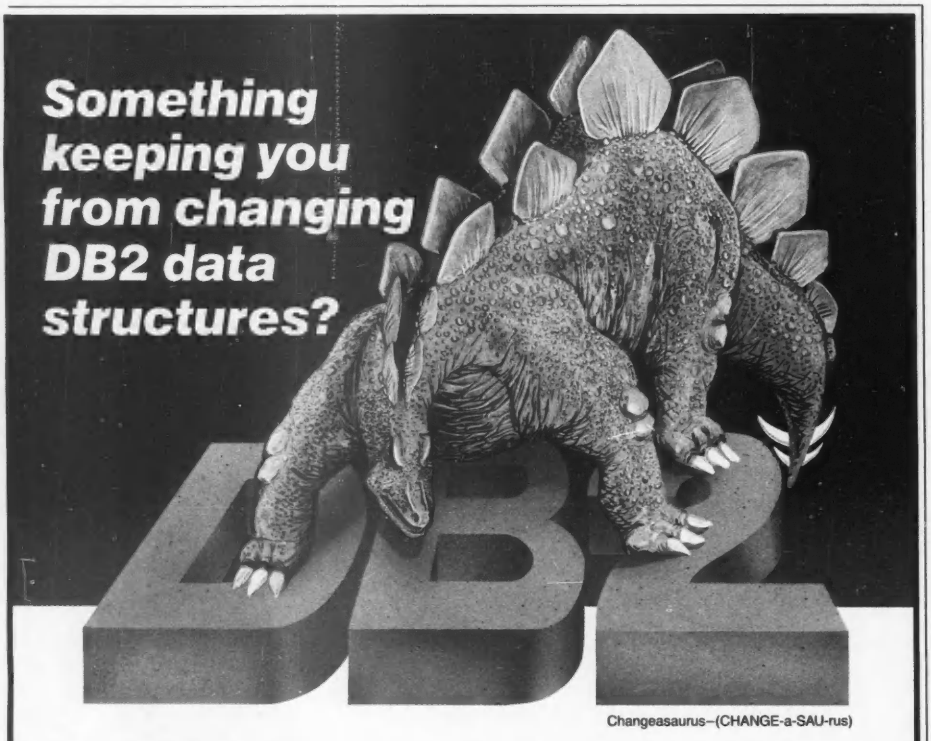
The company also brought out a family of products that facilitate enterprisewide networking of a variety of Filenet systems.

Remote linkage of Filenet systems can be accomplished via gateway processors and proprietary communications software. Both batch and on-line communications are supported, the company said. The firm's Workflo software manages the consistent flow of both data base and document-image over the network, Castle said.

To transfer large amounts of image data, users can choose to connect Filenet systems via 56K bit/sec. leased lines, 56K bit/sec. digital dial-up lines or T1 leased lines with a data transfer rate of 1.54M bit/sec.

The gateway processor and communications software lists for $35,000 and will be available in the second quarter, Castle noted.

The firm also introduced communication software to link multiple Filenet systems via a backbone Ethernet local-area network.



Changeasaurus–(CHANGE-a-SAU-rus)

It's not that you can't make a change; it's what happens when you do make a change. Changeasaurus, that jealous guardian of the DB2 catalog, is dangerous when provoked. Because of the demands of Changeasaurus, DBAs have spent upwards of 50% of their time battling complex change procedures.

But those days are gone. Now there's DB2 ALTER from BMC Software, which supports all changes to attributes of objects. DB2 ALTER automatically restores data, dependencies and authorizations. It features commit-point control and restart capability, and Rename, Migrate and Create Like commands.

DB2 ALTER provides:

- Complete control of the change process
- Reduced development and maintenance costs
- Elimination of costly user coding errors

For more information, or to begin a 30-Day-Plus Free Trial on DB2 ALTER, mail the attached coupon, or call BMC Software.

1-800-841-2031
in the USA or (713) 240-8800
1 800 231-2698 in Canada

BMC SOFTWARE

BMC Software, Inc. CW
P.O. Box 2002 • Sugar Land, TX 77487-2002

☐ Contact me about a 30-Day-Plus Free Trial of DB2 ALTER.
☐ Contact me with more information on DB2 ALTER.

Name _____
Title _____
Company _____
Address _____
City _____ State/Prov. _____ Zip/PC _____
Telephone _____

Utility prints wide 1-2-3 spreadsheets

CAMBRIDGE, Mass. — Funk Software, Inc. recently announced a new version of its Sideways software, a utility program that horizontally prints out wide, multicolumn data from 1-2-3 spreadsheets.

Sideways 3.2 acts as an add-in utility for Lotus Development Corp.'s 1-2-3, allowing users to print directly from the spreadsheet program.

The package is available now for $69.95; an upgrade for users of the earlier version costs $20.

The software uses the add-in technology that Lotus made available to third-party developers in January.

Acting as an extension of 1-2-3 Release 2, Sideways can be accessed with one keystroke without exiting from 1-2-3.

Funk Software claimed to have an installed base of 250,000 Sideways users. Like its predecessor, the product comes with a stand-alone program that lets users output any ASCII file onto most major printers, including Hewlett-Packard Co.'s Laserjet Plus.

Video Seven boards up

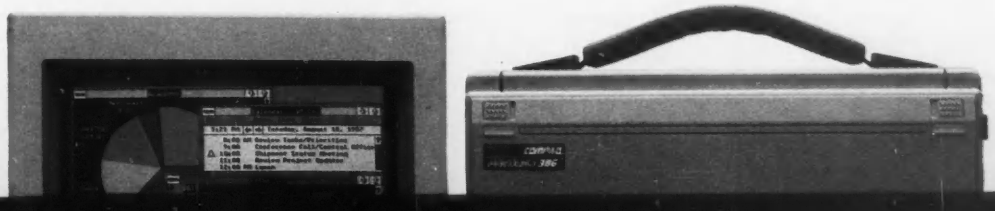
FREMONT, Calif. — Video Seven, Inc. announced last week a graphics board reportedly compatible with IBM's Video Graphics Array (VGA) and cut the price of its existing Enhanced Graphics Adapter (EGA)-compatible boards.

The $499 Vega VGA board was designed to bring IBM Personal System/2-style graphics to existing IBM Personal Computers and compatibles. The board also supports EGA, IBM's Color Graphics and Monochrome Display Adapters and the Hercules Computer Technology, Inc. Graphics Card. According to Video Seven, the Vega VGA board automatically switches between graphics modes.

The firm also reduced the price of its other boards, including its Vega board, which it lowered $150 to $249, and its Vega Deluxe, reduced $120 to $379.

Once again, Compaq raises the standard of performance for personal computers.

This time by a factor of two...



Introducing the two on earth

The new COMPAQ DESKPRO 386/20™

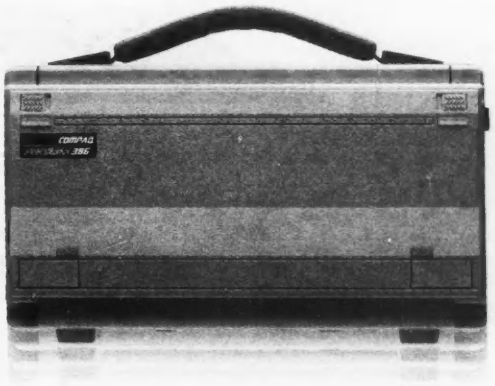
Last year, we introduced the COMPAQ DESKPRO 386,™ the most advanced personal computer in the world. Now the world has two new benchmarks from the leader in high-performance personal computing. The new 20-MHz COMPAQ DESKPRO 386/20 and the new 20-lb., 20-MHz COMPAQ PORTABLE 386 deliver system performance that can rival minicomputers'. Plus they introduce advanced capabilities, without obsoleting your investment in software, hardware and training.

Our new personal computers employ an industry-standard 20-MHz 80386 microprocessor and sophisticated 32-bit architecture. But to make these two of the world's fastest PC's, we did more than just increase the clock speed.

For instance, both are built around a concurrent bus architecture. Two buses—one for memory and one for peripherals—eliminate information bottlenecks, allowing each component

It simply works better.

most powerful PC's and off.



and the new 20-MHz COMPAQ PORTABLE 386™

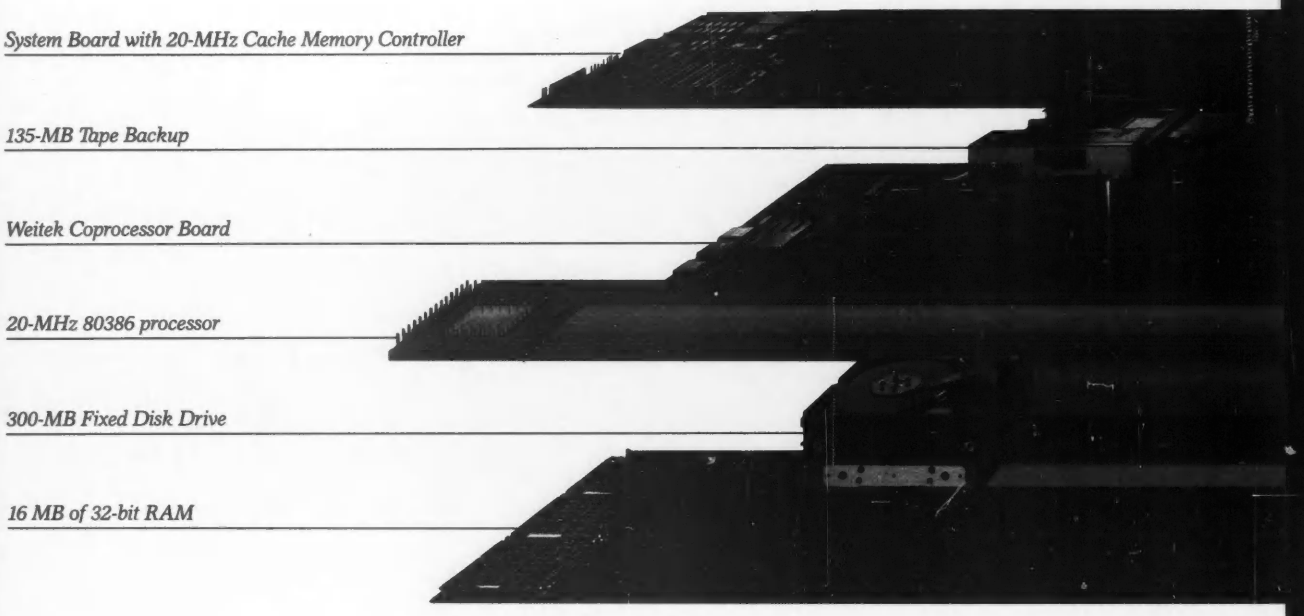
to run at its maximum speed. Together, they insure the highest system performance without sacrificing compatibility with industry-standard peripherals.

Both computers offer disk caching. Both offer the most memory and storage within their classes. Both let you run software being written to take advantage of 386 technology. And both run new MS-DOS®/BASIC Version 3.3 as published by Compaq. With it, our new portable and our new desktop can break the 32-megabyte limit on file sizes that handcuffs other PC's, allowing you to build files up to the size of your entire fixed disk drive.

And from now until December 31, 1987, both computers come with a free package of new Microsoft® Windows/386 Presentation Manager. It provides multitasking and switching capabilities with today's DOS applications to make you more productive. But that's just the beginning. To find out more, read on.

COMPAQ®

The question wasn't but how to get the


System Board with 20-MHz Cache Memory Controller
135-MB Tape Backup
Weitek Coprocessor Board
20-MHz 80386 processor
300-MB Fixed Disk Drive
16 MB of 32-bit RAM

The most powerful personal computer in the world

The COMPAQ DESKPRO 386/20 is an impressive 50% faster than 16-MHz 386-based personal computers.

Even more impressive is the fact that it's up to 25% faster than other 20-MHz 386's. That's because the microprocessor is just one small part of how the COMPAQ DESKPRO 386/20 outperforms every other PC in the world today and even many minicomputers.

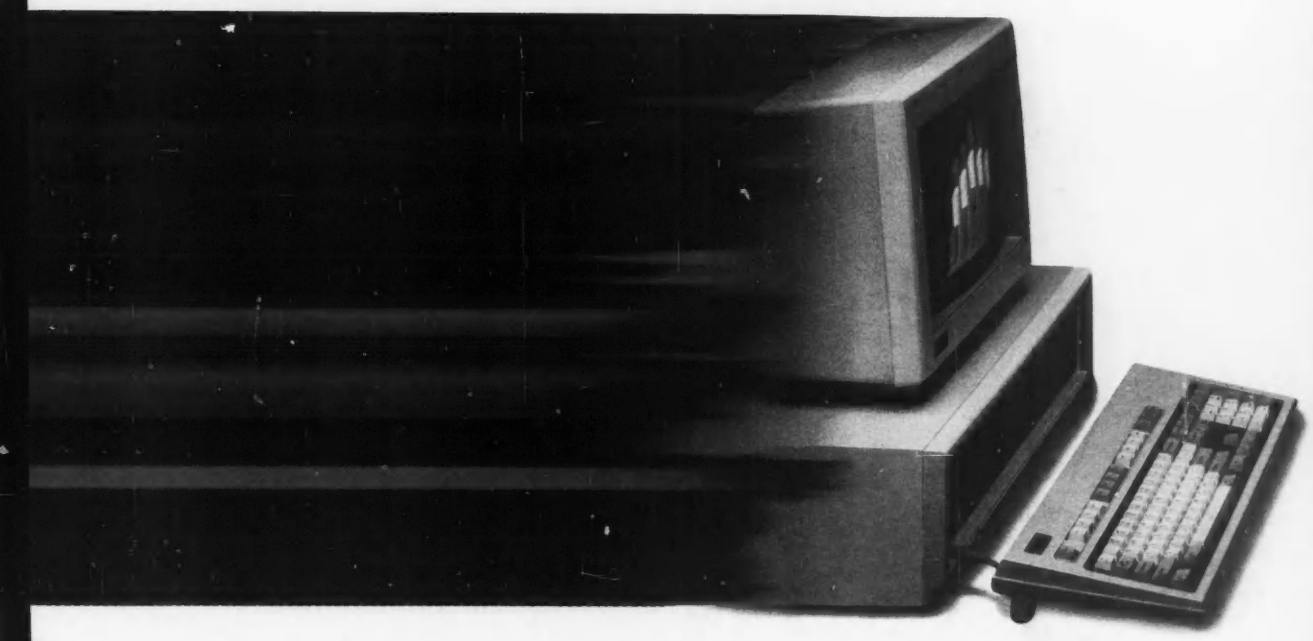
The big reason is the new COMPAQ Flexible Advanced Systems Architecture, which optimizes overall system throughput while maintaining full compatibility with industry-standard peripherals. It does this by combining a new, highly advanced memory caching scheme with memory and peripheral buses that operate concurrently.

Complementing the speed of the microprocessor is the new advanced 20-MHz Intel® 82385 Cache Memory Controller. Like an efficient secretary that keeps frequently used information close at hand, it allows the microprocessor to operate at 0-wait states 95% of the time.

While one bus handles these high-speed operations, another *simultaneously* handles peripherals operating at the industry-standard 8 MHz.

It simply works better.

how to get to 20 MHz, most out of 20 MHz.



This flexible approach allows you to dramatically increase system throughput while preserving your investment in monitors, disk drives, and expansion boards. It can also accommodate today's and tomorrow's most advanced peripherals without constraining their performance.

Take options like our new Weitek™ Coprocessor Board. Never before offered in a PC, it can increase the speed of calculation-intensive, engineering and scientific applications by a factor of six, giving the COMPAQ DESKPRO 386/20 the performance of a dedicated engineering workstation at a fraction of the cost.

Compaq also provides 130- and 300-Megabyte Fixed Disk Drives with some of the industry's fastest access times. And when used with disk caching software, they represent the highest-performance storage subsystems available.

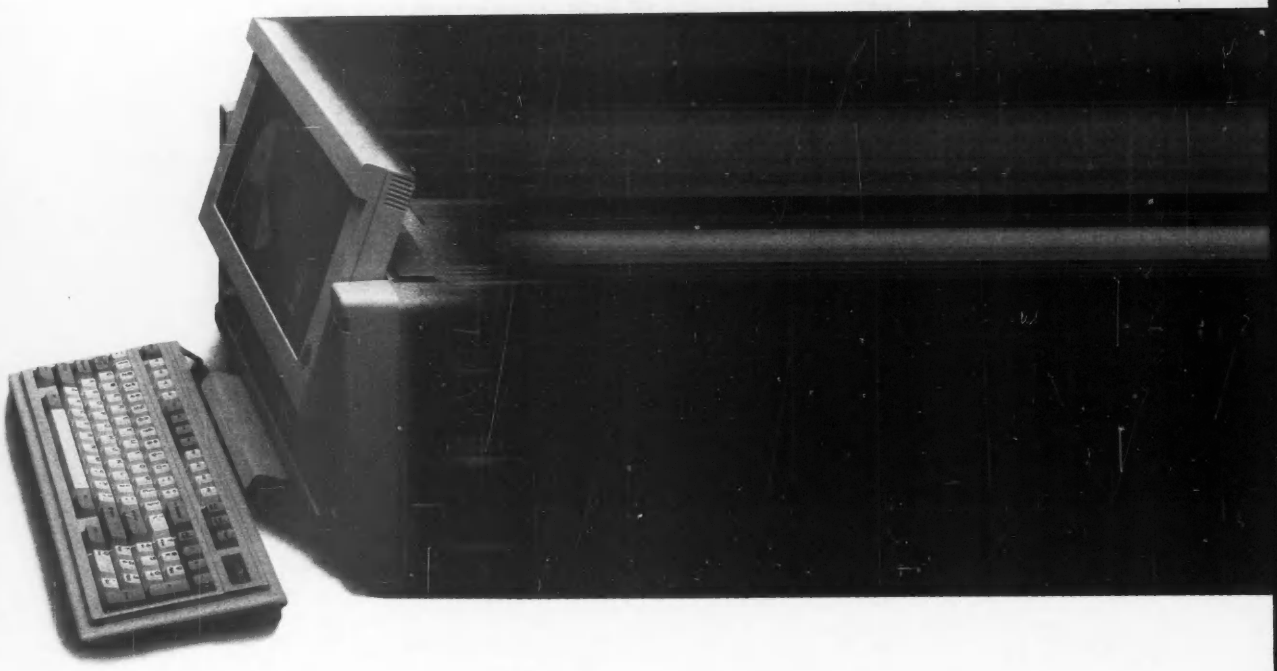
As for memory, Compaq offers 32-bit high-speed RAM. One full megabyte comes standard and is expandable to 16 megabytes without using an additional expansion slot. Plus, we included the COMPAQ Expanded Memory Manager. It supports the Lotus®/Intel/Microsoft® (LIM) Expanded Memory Specification (EMS) so your software can break the 640-Kbyte barrier even before OS/2™ is released.

As tasks become more complex and users demand more advanced capabilities, Compaq responds by raising the standard of performance in personal computing.

COMPAQ

DESKPRO 386/20™

Everyone expected Compaq But no one



Pound for pound, it is the world's most powerful computer

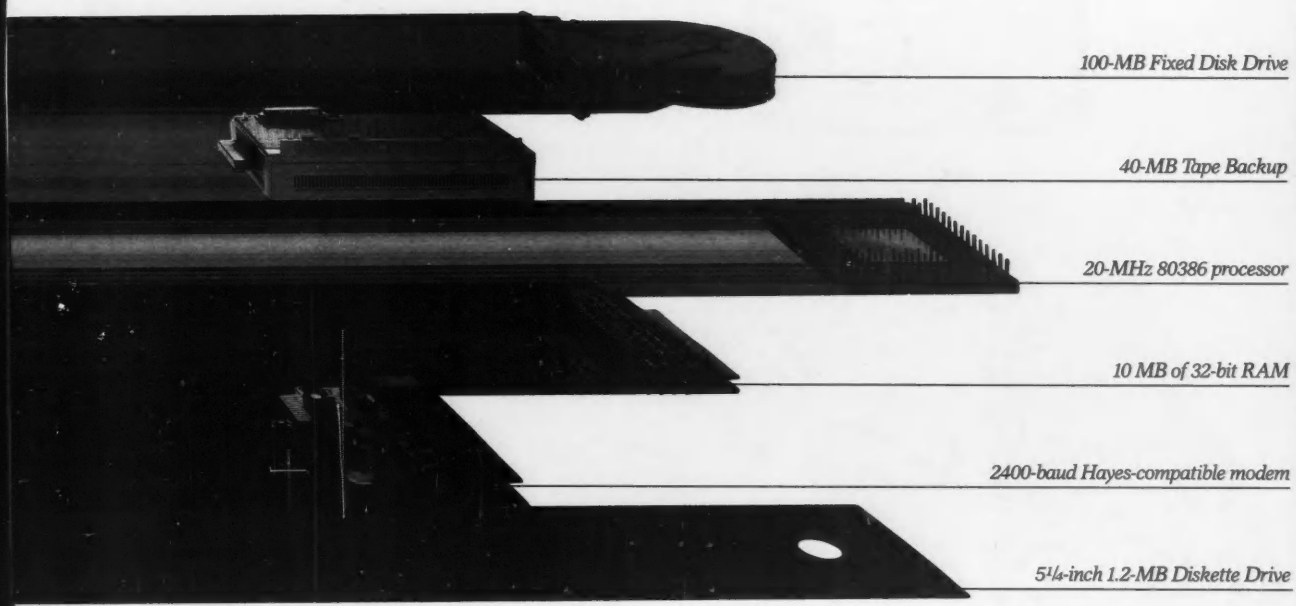
Compaq has long been recognized as the world leader in both 80386 technology and portable computing. So it isn't surprising that we would combine the two. But no one expected the new COMPAQ PORTABLE 386 to run at 20 MHz. And no one even dreamed that it would offer up to 100 megabytes of storage, up to 10 megabytes of high-speed RAM, disk caching, and much, much more, without sacrificing other features.

Our newest 20-lb. portable computer goes far beyond an 80386 microprocessor with a handle. It's not just the most advanced portable in the world. Pound for pound, it's the world's most powerful computer. Period.

Just like the recent 20-lb. COMPAQ PORTABLE III,™ which changed the shape of full-function portable computing, the COMPAQ PORTABLE 386 makes no compromises to achieve its level of performance. It offers more speed, memory, storage and features

It simply works better.

to introduce a 386 portable PC. expected all this.



than any other portable computer. It runs your current software up to 25% faster than 16-MHz 386 PC's. Beyond that, its performance in calculation-intensive applications is increased even more when you add an optional 20-MHz 80387 coprocessor.

Memory? Get one megabyte of 32-bit, high-speed RAM standard or go as high as 10 megabytes internally without using an expansion slot. And like all of the COMPAQ 386-based personal computers, it features the COMPAQ Expanded Memory Manager.

With our high-performance 100-megabyte internal fixed disk drive, you can actually fit 500 lbs. of data-filled pages into a 20-lb. PC, unsurpassed storage for a portable. If that's too much for you, we also offer a 40-megabyte model.

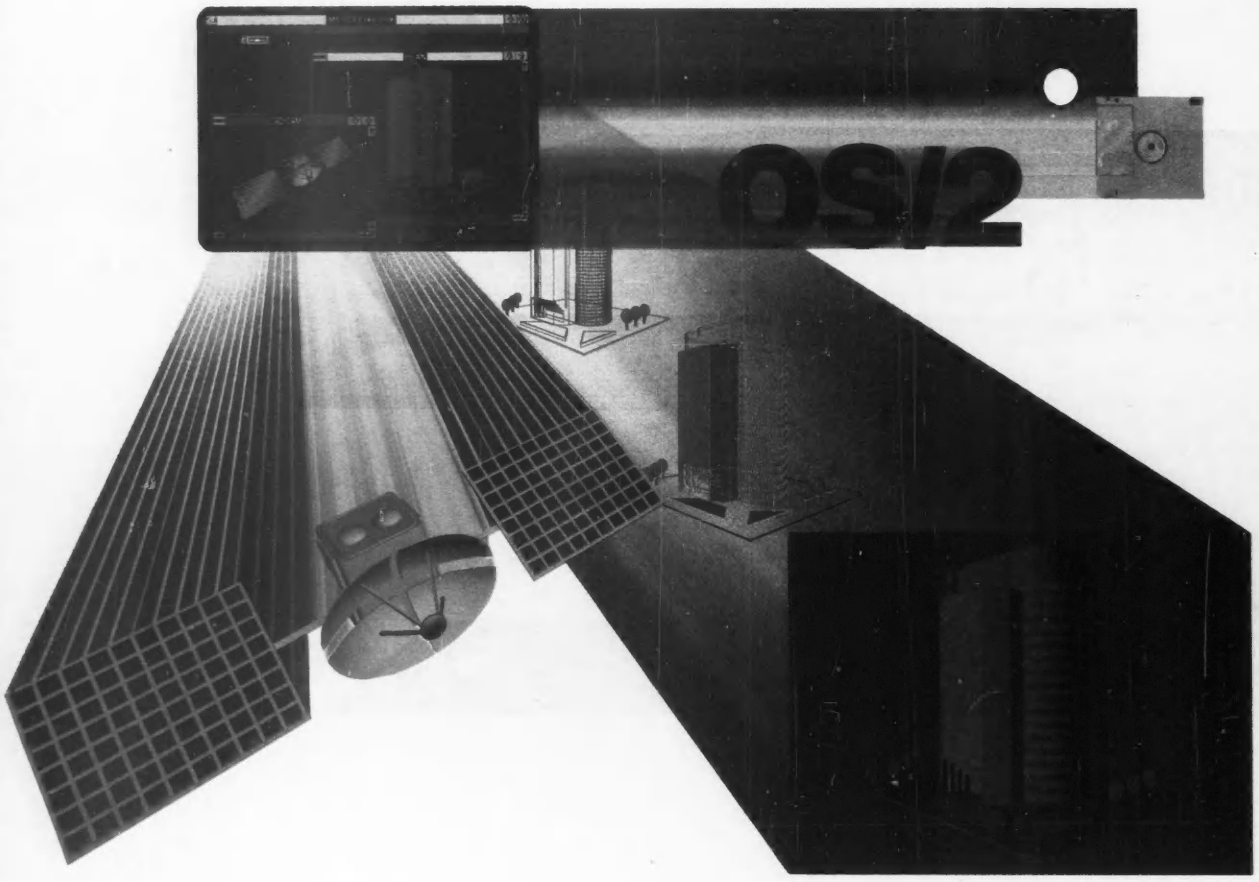
We've become famous for building desktop computer capabilities into our portables without leaving anything out. The COMPAQ PORTABLE 386 is more proof. It has a high-resolution, 640 × 400, 10-inch plasma display; a full-size, portable enhanced keyboard; two industry-standard expansion slots in a lightweight, optional plug-on unit; a choice between an optional 2400- or 1200-baud Hayes®-compatible modem; a full-size industry-standard 5¼-inch 1.2-MB diskette drive; even an optional 40-MB tape backup unit.

These features, combined with the ultimate in portable performance, make the COMPAQ PORTABLE 386 the *biggest* PC this *small*.

COMPAQ

PORTABLE 386™

Compaq moves you ahead without leaving you behind.



Compaq offers the most complete line of high-performance 386 solutions. They all run industry-standard software and hardware, protecting the investments you've already made.

At the same time you won't be left behind when other technologies become important. Perform multitasking with existing applications using Microsoft Windows/386 Presentation Manager. Add VGA graphics if you wish. Run OS/2 when it's available. And now 3½-inch drives are even an option for our desktops.

We optimize the most advanced technology while maintaining compatibility with the past, present and future. This makes COMPAQ PC's a wise decision for today's serious business users. Because at Compaq, we don't burn bridges, we build them.

See the COMPAQ DESKPRO 386/20 and COMPAQ PORTABLE 386 at an Authorized COMPAQ Computer Dealer. *And from now through December 31, 1987, get Microsoft Windows/386 Presentation Manager free when you buy a 386-based COMPAQ computer.* For more information, call 1-800-231-0900, Operator 40. In Canada, call 416-733-7876, Operator 40.

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COMPAQ®

It simply works better.

Mirrors

CONTINUED FROM PAGE 49

At that point, the copy of Mirror II caught my eye. Having reached the point at which I was ready to wing the modem out the window, I was ready to try anything. I broke the shrink-wrap, briskly ran through the Newuser and Setup routines (adding the needed S9=1 to the modem-initialization string) and was quickly up and running — although the modem died entirely a few days later.

While any number of other communications packages might have solved my problem, Mirror II was in the right place at the right time, and I decided to have a closer look at the program.

First off, it was immediately apparent that Mirror II most definitely does not copy the exact look and feel of Crosstalk XVI any longer. Instead, it has been modified in order to avoid the legal problems of the more direct copy of Crosstalk XVI in the earlier version.

The result is a decided improvement. I have never been a big fan of Crosstalk XVI's status-screen format, finding it busy and a bit confusing. Mirror II's variation is on the Crosstalk XVI status screen is easier to understand.

Mirror II also offers a number of enhancements to the Crosstalk XVI, which Softklone's documentation refers to as the "pre-Mirror" standard. These include additional commands as well as enhancements to pre-Mirror standard commands. One particularly useful feature, invoked with the "Background" command, is the ability to run Mirror II in background mode.

Yet another handy enhancement is the inclusion of an integrated text editor with Micropro Wordstar-like controls. This can be used for composing messages or writing script files. It is entered with a simple Edit command extension.

Other enhancements include an expanded set of terminal-emulation and file-transfer options. Mirror II provides, for example, support for the Hayes transmission protocols as well as the public domian protocol Xmodem (single and multi-file), Crosstalk Communications' Crosstalk, Masscomp's Kermit and Ymodem.

Perhaps best of all, however, is Mirror II's documentation. Bound in the form of a paperback book, the Mirror II manual not only offers an excellent reference source for the program but adds first-class coverage of nearly everything a user is likely to need to know about personal computer communications.

The bottom line is that the $69.95 Mirror II turns out to be much more than just the straightforward copy I'd originally expected it to be.

Mirror II also serves as a reminder that imitation combined with innovation offers one of the best sources of practical value to users.

Zachmann is vice-president of research at International Data Corp.

Wordstar

CONTINUED FROM PAGE 47

tion is a utility for writing up standard business forms, such as Federal Express slips or insurance forms. The product, called Fill-a-Form, sets up on-screen templates for commonly used forms so information can be printed directly onto standard forms.

"Fill-a-Form should be helpful to secretaries or anyone who has to use a typewriter to complete a lot of forms," said William Orr, an analyst with Palo Alto, Calif.-based First Affiliated Securities. Orr has used a beta-test version of the Personal Edition for the last six weeks.

'Non-techie' documentation

Orr also gave high marks to the documentation for the Personal Edition, noting its "non-techie" explanations, but he criticized the program's limited on-screen Help. Orr said the Help screens too often refer the user to the manual instead of displaying the keystrokes needed to solve a problem.

The Personal Edition also features Showtext, a program that creates such business presentations as overhead transparencies, slides and pamphlets. The program allows users to preview documents on-screen before printing.

The Legal Edition includes two programs from Cambridge-based Jurisoft, Inc. that make it easier for the user to prepare legal documents.

Comparerite checks final versions of documents with earlier drafts that are passed back and forth between attorneys.

Citerite is a citation checker that ensures footnotes in legal briefs conform to the tight style rules of the legal profession.

Reaching out to user base

The new products represent a push by Micropro to reconnect to an installed base of users that bought Micropro software in the late 1970s and early 1980s, when the company was at its peak. Micropro estimated it has shipped three million word processing packages since 1978.

Micropro's plan is to attract certain chunks of that base by developing updated products aimed at particular vertical markets, said Ellen Mait, a Micropro representative.

"The only reason Micropro lost ground was that they spent so many years screwing around and didn't capitalize on their installed base," Tarter said. "This kind of product is finally going to give a lot of those users a chance to upgrade."

The C-815 Supra 24-pin printer

My life in the fast lane

I used to spend a lot of my time waiting for our old printer to finish cranking out the paperwork for our busy corporation.

But since we bought the C-815 Supra from C. Itoh Digital Products, I never have a moment to spare. I'm living life in the fast lane.

Multi-applications solution

Our department managers love the C-815 Supra. It's like having two printers in one. It prints high volume data processing output, like invoices and spreadsheets, at speeds up to 570 characters per second (cps). And for word processing, the Supra prints sharp, clear, high-speed letter quality at 162 cps.

What really sold our DP/MIS management on the Supra was *Byte Magazine* and *Infoworld* listing the C-815 as the fastest 24-wire printer in their independent tests. And they were right. The Supra's speed and versatility increased our productivity.

Forms expert

Our executives are really impressed with the Supra's dependable, rugged paper handling. It manages continuous forms, labels, letterhead and up to 6-part invoices with its rear or bottom feed paper paths. In addition to its standard pull tractor, the C-815 also features a single-bin automatic sheet feeder that's upgradable to dual bin.

Whether it's high volume spreadsheets and multi-part invoices or letter quality business letters and presentations, the Supra is fast and reliable.

Sound investment

The finance department says the Supra is a great investment since C. Itoh has a long-standing reputation for high quality, durable printers. And because it has built-in emulations for the IBM ProPrinter XL,™ Toshiba P351™ and Qume Sprint 11,™ we don't have to invest in any new systems or software. It works with our new IBM PS/2™ family and such popular software packages as Lotus 1-2-3,™ WordPerfect™ and Chartmaster.™

With its top-notch output, superior paper handling and extremely fast printing, all the departments in our company now know what life in the fast lane is all about. I know I do.

C.ITOH

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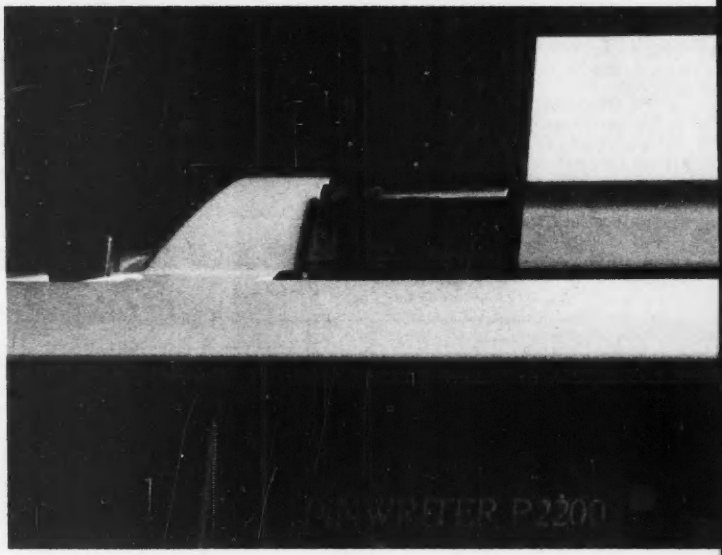
IF THE REASON YOU A 24-PIN PRINTER YOU'VE JUST LOST



You've also lost your last reason for buying a 9-pin printer. Our new Pinwriter® P2200 dot matrix printer is the first 24-pin printer that is priced lower than many of today's 9-pin printers.

However, we didn't strip the price by doing the same thing to features. In fact, we gave the P2200 a few features you won't find on any other printers at any price.

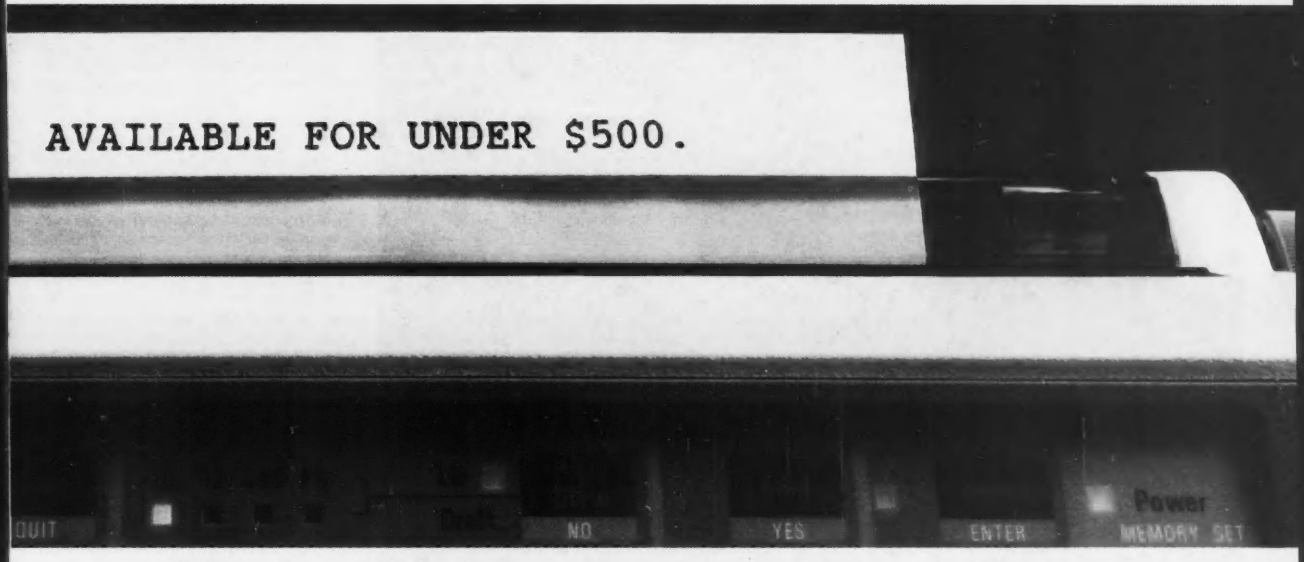
9-pin printer

24-pin printer

Like more software support than any other 24-pin printer and unrivaled paper-handling capabilities. It feeds from both the rear and the front. And you can print a single sheet without removing your continuous paper. You can also produce up to 128 type variations within a single document.

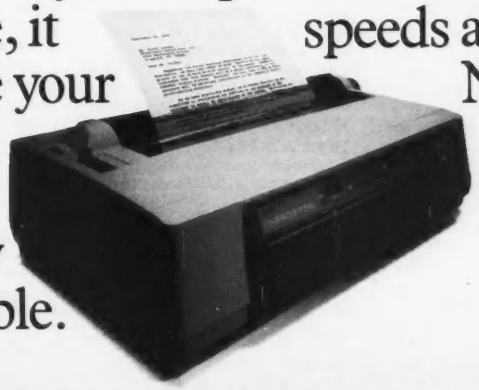
C&C Computers and Communications

HAVEN'T BOUGHT IS PRICE, YOUR REASON.



We also didn't get the price down at the expense of speed. The P2200 prints 55 cps in LQ mode—that's faster than any other printer in its price range. And in draft mode, it speeds along at 170 cps.

So see your NEC dealer today. Anything else would be thoroughly unreasonable.



NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

For more information and the name of the NECIS dealer nearest you, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

Kahn

CONTINUED FROM PAGE 49

what the other software publishers are doing.

Will we still see Philippe Kahn wearing togas and partying it up at company functions?
I don't see what parties have to do with building the best software tools. We had a toga party three years ago, and people are still talking about it. That was one toga party, and we haven't had one since, but hey, if you work hard you might as well have fun.

How do you see your role changing at Borland with the addition of Posner and Rosen?
Gradually, my role has become more strategic and less on the implementing side. However, strategically, I get involved a lot in the product definitions, development and marketing. And that's of great interest to me, much more so than the day-to-day responsibilities of the company.

Everybody is familiar with the fallout between Steve Jobs and John Sculley at Apple Computer, Inc. Do you see any problem with bringing anybody outside of Borland into the fold?
The difference between Ron Posner and John Sculley is that Ron Posner didn't come from a soda pop company. Something like that couldn't happen at Borland because of the way I control a majority of the stock.

But then again, if I became a problem for Borland — if I became the bottleneck — I think it would only be fair that the company prevail over myself.

So your ultimate safety valve is the fact that you own a majority of the stock?
Yeah, and also that I bring a positive contribution to the company — that's the ultimate safety valve.

Posner has said that this merger signals a whole new direction for Borland into the corporate marketplace. Is Borland going through an identity change?
No. It's a natural evolution for Borland. Borland is identified with high-performance products, and that will continue. It's true that our profile is rising in the corporate world, but it's not an identity change. It's just like you have to be a child, and then a teen-ager, and then an adult. So I think we've been a child, we've been a teen-ager, and now we're becoming an adult.

Why the push into coporate America? Is that the logical step for you?
Yes. We're coming out with corporate products: Paradox, Quattro and Sprint. And that audience is slightly different than for our programming languages and utilities.

Does that mean Borland is trying to get closer to the Big Three?
I don't care about the physical size of the company, we're smaller than any of the Big Three. I predict that soon you won't call them the Big Three, maybe you'll call them the Big Four or maybe one of the three will change. But that's beside the point. In this industry, you have to reach a critical mass in order to be credible, which we have.

But is the plan to get to that plateau, with the likes of Microsoft and Ashton-Tate?
The goal of the company is not to be big for the sake of being big. The goal is to provide continued growth to its shareholders, continued opportunities to its employees and continued better solutions to our customers. The rest is an ego trip that I'm not interested in.

It looks like Quattro is going to take a big swipe at Lotus in the spreadsheet market, but what about violating the look and feel of 1-2-3?
Copyrighting 1-2-3 is a hopeless attempt to stop the clock. 1-2-3 is a great product, but it was designed and shipped in 1982, and it's time for customers to be able to experience the next generation.

We've all looked into "look and feel," and everybody who has seen Quattro says it looks much better and feels much faster than 1-2-3. So if anybody has a look-and-feel problem, it might be Lotus, because 1-2-3 doesn't look as good, and it feels slower [than Quattro].

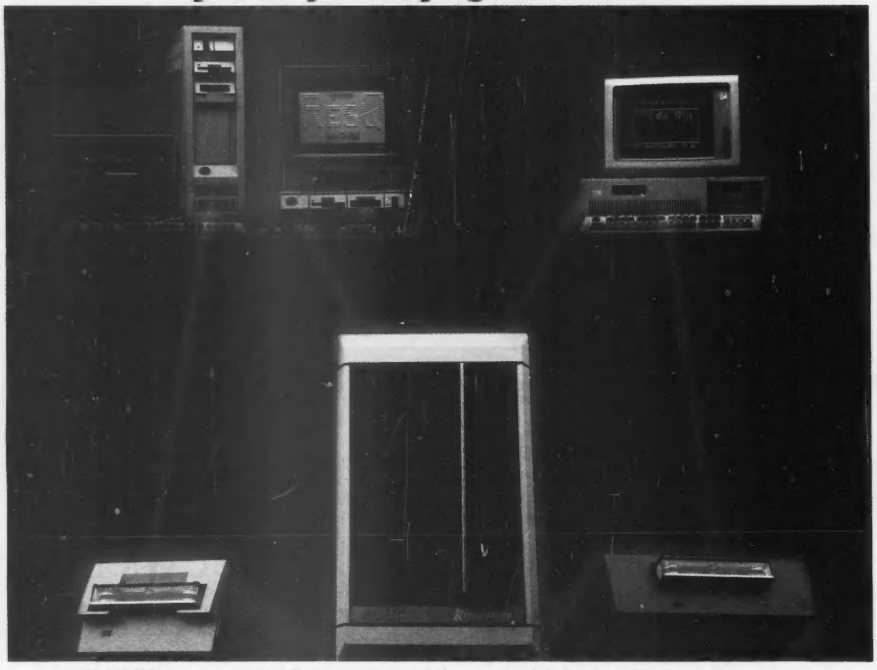
No matter how many lawyers you hire, you're not going to fix that, because you need a great engineering team to fix that kind of problem.

Borland has built a reputation as a publisher of low-priced software. How is your pricing plan going to change for these new mainstream business applications?
We announced that Sprint and Quattro will be $195, so we're still providing our customers with an exceptional value, because our products rival or surpass products that currently sell for $495. For corporations, it's an opportunity to acquire better products at a better price. Everybody loves a good deal, and it is wrong to say that corporations don't care about price.

It would be ridiculous if the only reason corporations bought software was because it was expensive. Corporations, like everybody else, are price-sensitive.

WARNING:

If you don't buy an ALLOY error-correcting tape drive, you may be buying into trouble.



ALLOY's error-correcting Retriever™ tape drives work with IBM standards — old and new.

The Torture Test

Before a tape drive becomes a **Retriever,** it's got to read tape — dirty tape, old tape, scratched tape, worn tape — and get the data back whole. Data that only ECC-encoding and error correcting tape drives can bring back. Retriever tape drives pass this test to help make sure that *your* data is readable — time after time, years from now — when you need it. And that, after all, is the reason you backup your data. Don't settle for less.

Choose the Right Retriever for You

Retriever/40 packs 40 MBytes of data onto a compact DC-2000 type mini-cartridge. Designed to fit *into* your AT or compatible, or Compaq 386™ Interchanges data with the Tape System/2.

Tape System/2™ is the 40 MByte Retriever expressly designed to fit into your IBM Personal System/2™ Model 50, 60 or 80. No controller card required. Exchanges data with the Retriever/40.

Retriever/120 gives you 120 MBytes of error correcting data storage. Works with ATs and compatibles, Compaq 386 and all models of the Personal System/2. Ideal for network backup. Attach up to 4 Retriever/120's for automatic backup or restore of up to 480 MBytes of data — unattended.

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In Europe: Alloy Computer Products (Europe) Ltd., Tel. 0285-69571, Tlx: 43340 In Australia: Alloy Australia Pty. Ltd., Tel. 011-613-561-4988

Compaq

FROM PAGE 47

to Gary Stimac, Compaq's vice-president of systems engineering, Compaq refuses to get drawn into "bus wars" with IBM. He notes that the bus is a passive part of the overall architecture and that the Flex architecture optimizes the more active parts of the system, such as the CPU, memory, disk subsystem and various coprocessors. "Nobody should care what's underneath an architecture, be it Micro Channel or industry-standard," Stimac says. "People instead should be looking to see if that architecture limits the performance of peripherals."

While Compaq's share of the Fortune 1,000 market is small compared with IBM's, the 386/20s' speed and performance — not to mention compatibility with existing standards — should give MIS managers of even the big IBM shops something to think about.

They're baaaack. With the disappointing sales of Jazz and the company's ambiguity about future products for the Apple Macintosh, a lot of people assumed Lotus had done the back-off-bugaboo to the IBM world and other unexplored environments. Not true. In an attempt to step into the spotlight that shone brightly on Microsoft's Excel announcement last week, Lotus announced 1-2-3 for the Mac and an updated version of Jazz called Modern Jazz (a great name).

Lotus's redoubling its efforts in the Mac market makes sense for a couple of reasons. First, with the way Mac sales have been going the last 18 months, there's ample opportunity for Lotus to rake in some serious bucks despite Microsoft's commanding position in the Mac applications market.

Second, if Lotus is serious about establishing 1-2-3 as the dominant spreadsheet across multiple architectures (including DEC's, in which there will probably be a growing connection between DEC and Apple systems in the engineering market and in which Lotus is reportedly developing some compatible products), the firm will need a strong Mac product.

Chuck Digate, senior vice-president of Lotus's Software Products Group, says he anticipates that in two years, Macintoshes and IBM-compatible systems sharing a network will be commonplace. "Applications that span a mixed hardware environment will be very strong. In two years, there will be a major need for that, and Lotus wants to be a strong player," Digate says. The arm-wrestling match shaping up between Lotus and Microsoft in this mixed hardware environment is enough to make Sylvester Stallone's character in *Over the Top* envious.

Caution: Propeller-head on board. If the slogans on those irritating yellow car signs aren't to your liking, now you can design your own. Zebra Systems recently came out with a software package that allows the user to create a sign with his own personalized message. At $29.95, I suppose it's the perfect gift for the technoid who has everything. While a site license isn't available with the product, it does require a driver's license.

Scannell is *Computerworld*'s senior editor, microcomputers.

Add-in links

FROM PAGE 47

founder of Network Innovations.

Excel and Multiplex/XL communicate through the Dynamic Data Exchange (DDE) protocol, a new feature in Microsoft Windows 2.0 for interapplication connectivity. Users can call on an Excel macro to pass requests from the spreadsheet to Multiplex/XL via the DDE protocol, the company said.

Multiplex/XL automatically establishes a connection with the host data base in the background and executes the query while the personal computer user continues to interact with Excel on the micro. When the query is complete, Excel automatically notifies the user and incorporates the results into the spreadsheet.

The product is priced at $99 per PC. It is available on a broad variety of host systems for license fees ranging from $3,000 to $18,000.

In addition to Multiplex/XL, Network Innovations recently introduced Multiplex/PC for Oracle, software that links packages such as Ashton-Tate's Dbase III to Oracle Corp.'s Oracle data bases on PCs.

Multiplex/PC is priced at $195 per micro and is also available with a range of host systems for a license fee ranging from $695 to $18,000.

PS/2s

FROM PAGE 49

capabilities. The low end just doesn't fit into our plans."

Lee Nolan, manager of the telecommunications division for The Travelers Corp.'s data processing department, said the Models 25 and 30 "aren't business machines. They're very limited in functionality."

Many corporate users requiring only a low-functionality workstation are looking to inexpensive clones. Tom Heany, a supervisor of data processing at General Electric Co., said his department will purchase microcomputers from Tandy Corp. "They're considerably less expensive," Heany explained.

While schools and homes are natural markets for the low end of the PS/2 line, it may also appeal to the small-business user wishing to use the computers as either stand-alones or nodes in a local-area network (LAN).

Bill Lempesis, an industry analyst for Dataquest, Inc., said the primary appeal of both the Model 25 and the Model 30 is the IBM label.

'Security blanket'

"A lot of people are still primarily buying IBM," Lempesis explained. "There's a certain security blanket that goes along with it. You can question why anyone buys almost any IBM system. Why do people continue to buy the [IBM] PC AT when you can get a [Dell Computer Corp.] PC's Limited 286 for half the price?"

Bernard Blain, director of systems for Cigna Corp., said his department will purchase between 100 and 150 Model 30s during the next year to be used as terminals connected to an IBM mainframe.

"It's a good alternative to a terminal," Blain explained. "It allows me to do a lot more computing work, so I don't have to go back and forth over network lines."

Both the Model 25 and the Model 30, IBM's low-end offerings in the PS/2 line, are based on an 8-MHz Intel 8086 microprocessor. The difference between the two is in design, storage capabilities and expandability. While the Model 30 offers two 720K-byte 3½-in. flexible disk drives plus room for a 20M-byte 3½-in. hard disk drive, the Model 25 features a single 3½-in. floppy drive.

List price on the Model 30 is $2,995 without a monitor. Priced at $1,350, the "small-footprint" Model 25 features a built-in monochrome monitor. A version with a built-in color display is priced at $1,750.

Lack specialities

Both systems lack many of the specialities of the PS/2 line, features intended to distinguish those systems from the IBM PC clones flooding the market in recent years.

Neither the Model 25 nor the Model 30 can run IBM's as-yet unreleased OS/2 operating system, since it requires at least an 80286 microprocessor. They also do not offer Video Graphics Array graphics and do not use the Micro Channel, IBM's new proprietary bus.

While IBM is primarily targeting the Model 25 at the education market and the home user, it has designed both the Model 25 and the Model 30 to be nodes in a LAN or as a connection to its mainframes.

Headset

FROM PAGE 49

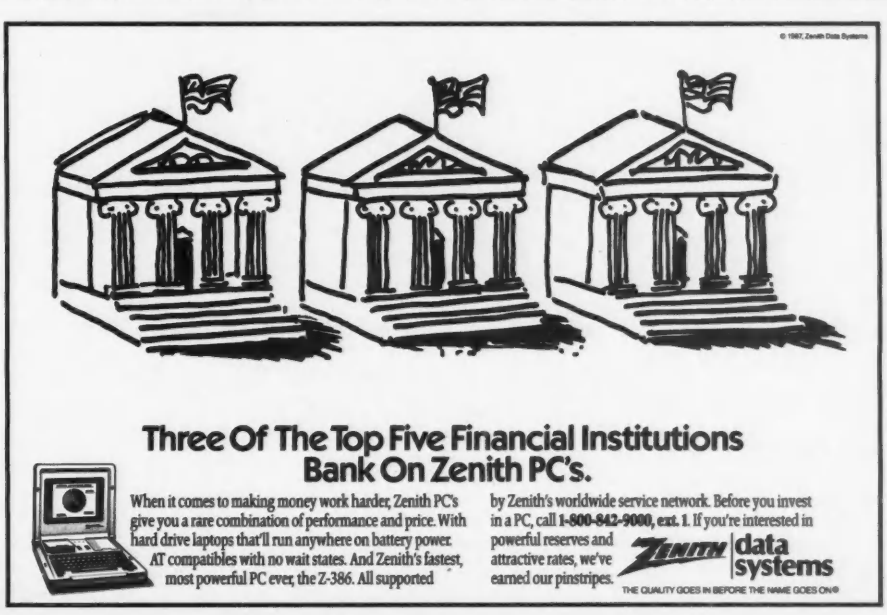
blowing into the puff switch tube, a character is selected as if it had been clicked by the mouse.

Because the headset works like a mouse, any software program designed for the Macintosh can be used with it. Richards says he currently uses Apple's Macdraw and Superpaint.

"The Mac is one of the best all-around computers for someone like myself," Richards says, because it uses single-keystroke commands. He adds that he is able to type approximately 20 words per minute.

And for the disabled, the ability to use the headset can provide independence. "Once I'm on the Macintosh with the hard disk, I don't have to have anybody around, because everything is on the hard disk. I'm independent," Richards says.

The price of the package, including the Headmaster mouse replacement device, the puff switch and the software, is $995.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NEW PRODUCTS

Systems

An Intel Corp. 80386-based portable microcomputer said to be capable of housing up to 16M bytes of memory has been announced by **American Micro Technology.**

The IBM Personal Computer AT-compatible system, called the **Trans/Pro9**, operates at 8- or 16-MHz clockspeed and provides a socket for an 80387 math coprocessor. It comes with BIOS, a 1.2M-byte floppy disk drive, a PC AT-style keyboard, a disk controller, an 800- by 400-line 9-in. monitor, 192W power supply and security key lock. It weighs about 40 lbs., the vendor said.

The *Trans/Pro9*

Other features include four 16-bit AT-compatible card slots, two PC-compatible card slots and two 32-bit slots.

The Trans/Pro9 is priced from $2,399.

American Micro Technology, 14751-B Franklin Ave., Tustin, Calif. 92680. 714-731-6800.

A language processor card and two versions of the IBM-compatible HP Vectra PC system, all featuring the HP Basic instrument-control language, have been announced by **Hewlett-Packard Co.**

The **HP 82300A** language processor card can be plugged into existing HP Vectra PCs, or the language can be purchased bundled into a monochrome or color system version of the HP Vectra PC that is called the **HP PC-308** Basic controller.

The language processor card contains a Motorola, Inc. MC68000 microprocessor and up to 4M bytes of memory, so HP Basic programs written for background operation can run at the same time as Microsoft Corp. MS-DOS-based operations.

The HP 82300 A Basic language processor card costs $1,320. The HP PC-308M monochrome Basic controller bundle costs $5,760, and the color system, the HP PC-308C, costs $6,530.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303. 800-367-4772.

Four members of the **Paragon** family of integrated personal computers have been announced by **Mitac.**

Each product features a floppy-disk controller, serial and parallel ports, a real-time clock with battery backup, five full-size expansion slots, networking capabilities, an optional math coprocessor socket, licensed BIOS from Phoenix Technologies, Inc. and Microsoft Corp.'s MS-DOS 3.2 and GW Basic.

The Paragon 386 Intel Corp. 80386-based system costs $4,895. The Paragon 286 Intel 80286 12-MHz CPU-based system costs $3,350. The Paragon 286S uses an 80286-10 CPU and automatically selects the proper graphics mode for the software being used. It costs $2,895. The Paragon 88 is a Turbo IBM Personal Computer XT-type system. It costs $1,195.

Mitac, 410 E. Plumeria, San Jose, Calif. 408-432-1160.

Software applications packages

Project Outlook, a project management system that runs under Microsoft Corp. Windows, has been announced by **Strategic Software Planning Corp.**

The software is said to provide "what-if" scenarios. Users can build a schedule on-screen with a linked Gantt Chart or in out-form using a built-in out-line processor. According to the vendor, Project Outlook will display a baseline schedule immediately upon the inputting of activities, dates, durations and connectors.

Project Outlook costs $495. The vendor's Promis project management system is required as the host system for Project Outlook.

Strategic Software, 245 First St., Cambridge, Mass. 02142. 617-577-8800.

A decision analyzer said to provide concise analytical conclusions using the paired-preference technique has been introduced by **Sterling Castle Software.**

The program, called **Bestchoice**, features a mathematical algorithm that allows it to simplify a problem with up to 30 possible choices into a series of pairs. Each pair can be evaluated by one to five decision makers using up to five criteria with relative weighting. Bestchoice statistically rates and ranks the choices. It also generates hard copy reports.

Bestchoice runs on IBM Personal Computers and compatibles. It costs $49.

Sterling Castle Software, Suite 174, 702 Washington St., Marina del Rey, Calif. 90292. 213-306-3020.

Peachtree Software, Inc. has released an enhanced version of its Compiete Accounting System for IBM Personal Computers, called the **Peachtree Complete II.**

The eight-module package features

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pop-up menus, on-line context-sensitive Help and standard English error messages. According to the vendor, all eight modules, including General Ledger, Accounts Payable, Accounts Receivable, Invoicing, Fixed Assets, Job Cost, Inventory and Payroll, can be customized.

Other features include a 160-char. field for invoice descriptions, the automatic reversal of journal entries, budget and prior-year comparisons, consolidated financial statements for multiple companies and check printing from multiple bank accounts.

Peachtree Complete II costs $199.

Peachtree Software, 4355 Shackleford Road, Norcross, Ga. 30093. 404-564-5700.

A financial analysis software package designed for use on Microsoft Corp. MS-DOS-based computers has been announced by **Precision Data, Inc.**

The program, called **What If**, is made up of a mortgage calculating system and a loan-and-investment program. The mortgage calculating system features conventional, variable-rate and balloon-rate mortgage types. The loan and investment program figures loan financing and provides analysis on existing or potential investments. The program also prepares amortization schedules.

Each portion of What If has its own documentation. What If costs $79. The two portions, complete with documentation, can be purchased separately for $49.95 each.

Precision Data, 206 W. Michigan St., Mt. Pleasant, Mich. 48858. 517-772-5055.

Software utilities

A menu-driven utility program, designed to simplify the use of downloadable soft fonts with Hewlett-Packard Co. laser printers, has been added by **Human Touch Software.**

The utility, called the **Soft Font Manager**, replaces file names, font identification numbers and printer commands with cursor key selection from a font-list menu that can be customized. Features include font-management functions such as downloading and deleting and the creation of proportional-width tables.

The Soft Font Manager costs $49.95.

Human Touch, Suite 100, 8795 La Riveria Drive, Sacramento, Calif. 95826. 916-369-1261.

An on-disk library of macros designed for use with Wordperfect Corp.'s Wordperfect Version 4.1 and 4.2 has been announced by **Powermax Co.**

The program is said to automate word processing functions into one-key operations. Features include printing the last page of a document first, an automatic bookmark and orienting addresses from the computer screen to an envelope.

Powermax costs $19.95.

Powermax, Suite 845, 15840 Ventura Blvd., Encino, Calif. 91436. 818-905-5919.

Development tools

A software development tool for the Geometric Arithmetic Parallel Processor (GAPP), said to allow an IBM Personal Computer-compatible system to evaluate, simulate and develop GAPP-based systems, has been announced by **NCR Corp.'s Microelectronics Division.**

The tool, **NCR45GS4**, runs on Microsoft Corp. MS-DOS. The package contains four component modules: the NCR GAPP Algorithm Language compiler; GAPP controller microcode generator; a library of coded-in routines; and a simulator for both a GAPP array board and a controller board.

The product costs $1,995.

NCR, Dayton, Ohio 45479. 303-226-9550.

Radio Shack, a division of Tandy Corp., has released the **OS-9 Development System** for the Color Computer 3.

The OS-9 Development System is an editor/assembler with full-screen editing and specialty I/O drivers.

The OS-9 Development System is priced at $99.95. It requires the OS-9 Level Two operating system.

Radio Shack, 1800 One Tandy Center, Fort Worth, Texas 76102. 817-390-3487.

Version 7.0 of the **APL Plus System** for the PC application development program has been released by **STSC, Inc.**

Version 7.0 features a virtual workspace mode, which allows the transfer of items in and out of the workspace, and Lotus/Intel/Microsoft Expanded Memory Specification support, providing access to an additional 64K bytes of memory. Also included are ANSI-standard graphics drivers.

The system is priced at $695. Registered users may upgrade to Version 7.0 for $150.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852. 301-984-5000.

Printers/Plotters/Peripherals

Screen Sender, a transmitter and repeater pair said to allow computer monitors to be located up to 1,000 ft from the computer, has been announced by **Communications Specialties, Inc.**

According to the vendor, the transmitter and the repeater can each drive a local monitor, and the repeater can drive another repeater up to 1,000 ft away. Screen Sender can be used with monochrome and IBM Color

The *Screen Sender*

Graphics Adapter and Enhanced Graphics Adapter monitors.

The Screen Sender transmitter and repeater pair costs $495. Separately, the transmitter and repeater cost $249 each.

Communications Specialties, 6090 Jericho Tnpk., Commack, N.Y. 11725. 516-499-0907.

A hand-held optical data input system, designed to enter text or data directly into Microsoft Corp. MS-DOS-compatible software applications, has been announced by **Transimage Corp.**

The **Transimage 1000** is said to read fully formed characters from fixed-pitch, proportionally spaced, typeset, typewritten, near-letter-quality and laser-generated documents. It accommodates variable character sizes and operates at a speed of up to 40 char./sec.

Designed for use with IBM Personal Computers and compatibles, the system consists of a hand-held scanner, a microprocessor board and system software. It costs $2,595.

Transimage, 910 Benicia Ave., Sunnyvale, Calif. 94086. 408-733-4111.

Board-level devices

A half-size card for IBM Personal Computers said to provide graphics, mouse and dual-channel music/voice synthesizer ports has been announced by **Electro Design, Inc.**

The **Audio/Video/Mouse Board** features either monochrome or color graphics in 640- by 200-pixel resolution. The single video port automatically provides the correct signal configuration of use without modification of either color or monochrome monitors. The dual audio synthesizers can be programmed to provide voice commands or sound effects, and digitized music can be played from the PC.

Up to four cards can be used in one computer.

The card is priced at $395.

Electro Design, 690 Rancheros Drive, San Marcos, Calif. 92069. 619-471-0680.

An expanded memory board for the IBM Personal System/2 Model 30 has been announced by **Ideassociates, Inc.**

The board, called the **Ideamax 30**, utilizes surface-mount technology to provide up to 8M bytes of Lotus/Intel/Microsoft Expanded Memory Specification. Software enables users to create a ramdisk as well as providing software-directed switch setting, memory diagnostics and a port-swapping utility.

Ideamax 30 is priced from $485 for 512K bytes of memory. It also operates on the IBM Personal Computer and PC XT.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821. 617-663-6878.

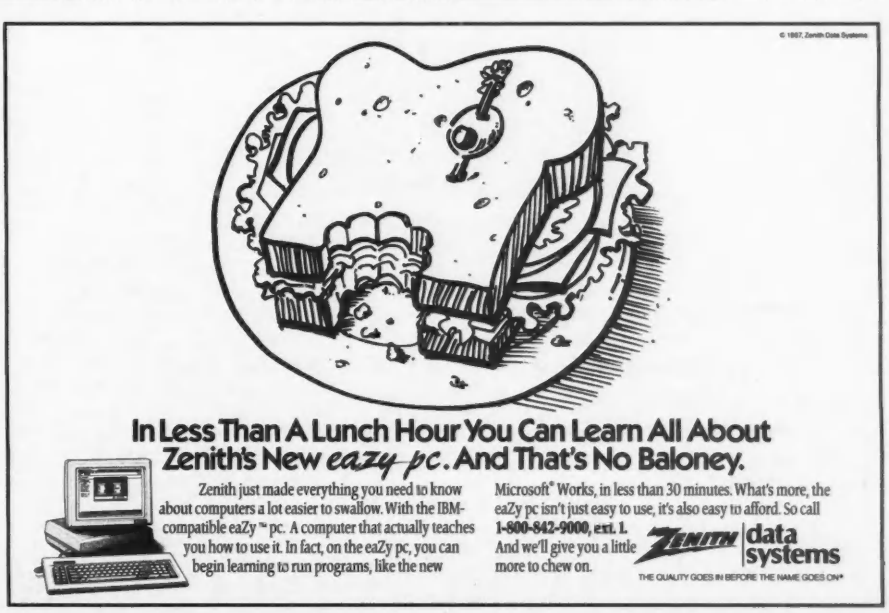
A 1,024- by 768-pixel color graphics controller for IBM Personal Computer-based computer-aided design, manufacturing and engineering applications has been announced by **Galagraph, Inc.**

The **Galaxy Mercury** controller is powered by the vendor's Quicksilver graphics processor. It is also equipped with Galaxy Magnicad, which displays simultaneously 16 colors from a palette of 4,096 in a 19-in. noninterlaced flicker-free format.

Other features include instant zoom-magnification windows and a 1M-byte display memory.

The Galaxy Mercury is priced at $1,995.

Galagraph, 1270 Lawrence Station Road, Sunnyvale, Calif. 94089. 408-734-2202.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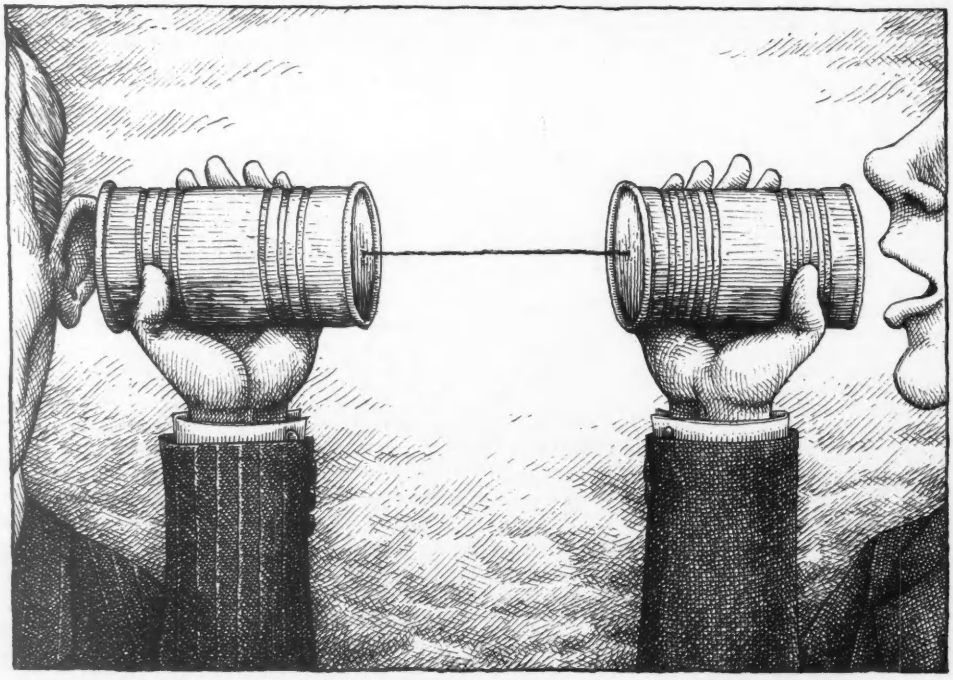

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DATA STREAM

Elisabeth Horwitt

Who will manage nets?

A year ago, it looked like IBM would bear away the network management standard before anyone else entered the list. More than 25 companies now support IBM's Netview/PC interface, and the fact that more and more telecommunications departments report to MIS hasn't hurt IBM's drive to bring wide-area networking under Systems Network Architecture control, at least within its own customer base.

Not all users — and certainly not all vendors — would rejoice at an IBM-based network management standard, if only because it would increase the vendor's stranglehold on the computer industry.

But all that may be academic, since it is becoming clear that networking people are not passively grouping themselves under the Netview flag.

In the past few months, the rival standards have been raised: AT&T, Timeplex and Digital Communications Associates (DCA) all announced "open" network management architectures that they claim will eventually tie together not only their own networking products but the offerings of any other company willing to support their architectures as an industry standard.

This is fine for those who approve of competition on principle

Continued on page 76

Pacific Bell stakes ISDN claim

Will begin 16-month test of Primary Rate Interface at West Coast sites

BY ELISABETH HORWITT and KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — Pacific Bell has made a preliminary commitment to the Integrated Services Digital Network (ISDN) with its first ISDN test implementation, which will take place in three California cities.

Parent company Pacific Telesis Group (Pactel) is one of the last regional Bell holding companies to announce an ISDN customer test. Pactel is still awaiting a Federal Communications Commission decision on Project Victoria, an ISDN-like but not ISDN-compatible networking service that it has been testing for more than a year.

The 16-month ISDN test will involve seven user companies, including Sunnyvale, Calif.-based Lockheed Missiles & Space Co., a few unnamed San Francisco companies and a San Ramon, Calif., petroleum corporation.

According to a Pacific Bell spokesman, the experiment will not explore the marketing ramifications of ISDN but rather was designed to test ISDN technology under a variety of circumstances. The project involves private branch exchanges from AT&T, NEC Corp. and Northern Telecom, Inc. in each city.

First commercial test

This is believed to be the first commercial trial to test the ISDN Primary Rate Interface, which defines 23 B channels carrying digital data and voice transmissions at up to 64K bit/sec., plus a separate D channel for signaling. It is typically used for T1 connections between user sites and the nearest carrier's central office or between high-speed switching and computing systems. Other trials reportedly have only tested the ISDN Basic Rate Interface, which defines two B channels.

With the Primary Rate Interface, users will be able to identify phone numbers of callers and will have automatic least-call routing from the central office, digital facsimile services and micro-to-mainframe transmission, Pacific Bell spokesmen said.

Lockheed will kick off Pacific Bell's ISDN test by implementing 37 Basic Rate ISDN links between its site and an AT&T 5ESS switch running ISDN software at the local carrier's central office. At Lockheed, users will attempt to create applications for computer-aided design, engineering support and local-area networking over the ISDN facilities. Hayes Microcomputer Products, Inc. and AT&T Network Systems have offered to help test the technology for Lockheed.

Primary Rate Interface testing will all begin in the second quarter of 1988 at the San Ramon site. Transmissions will run between a Northern Telecom Meridan SL-1 PBX and a DMS-100 switch at a nearby Pacific

Continued on page 70

User jumps IBM ship for DEC

BY ELISABETH HORWITT
CW STAFF

PORTSMOUTH, N.H. — IBM has not been able to bring its distributed computing strategy up to speed fast enough to prevent one of its major customers, Liberty Mutual Insurance Co., from choosing Digital Equipment Corp. for its departmental processing needs.

Liberty Mutual decided to buy its distributed office automation systems from DEC rather than IBM primarily because "IBM's distributed strategy time frame was not what we needed to solve our problems in the field," Kenneth Lanzillo, the company's DEC project manager, said recently.

The insurance firm has initiated a project to distribute data and applications down to departmental systems in branch offices. "We will be able to put VAXs in each of our offices and combine word processing and electronic mail with data processing applications, all under All-In-1," Lanzillo explained, referring to DEC's office automation package.

Making the connection

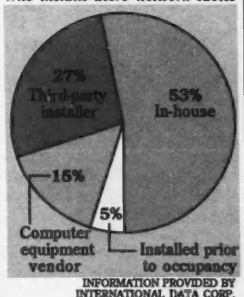
Connection between DEC and IBM systems will be provided through the Decnet Systems

Continued on page 72

Data View

Cable

Who installs users' network cables



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Gandalf net package builds ISDN bridges

BY PATRICIA KEEFE
CW STAFF

WHEELING, Ill. — Gandalf Data, Inc. recently announced Starmaster, a software-based hybrid networking package said to connect multivendor, multitechnology and multi-CPU facilities.

Starmaster also aids network managers by enabling management of a dynamic distributed processing environment through a common communications system and by delivering centralized control management and support, according to Gandalf.

The package also provides gateways and bridges to emerging network strategies such as Integrated Services Digital Network (ISDN), the vendor claimed. For example, Starmaster provides more than 50,000 B channels capable of operating at

Continued on page 77

Inside

- Bridge gives TCP/IP tool a boost. Page 70.
- IEEE meeting looks at twisted-pair Ethernet standards. Page 77.

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BIT BLAST

Bridge includes customizer in TCP/IP boost

Bridge Communications, Inc. has upgraded its Transmission Control Protocol/Internet Protocol (TCP/IP) software with a programming language. TCP/IP 2000 will run across all Bridge token-ring, broadband and Ethernet servers. It is available as a free software upgrade under the firm's software maintenance program. The software's macros can be strung together to create a menu-based environment that adds ease-of-use and security features, Bridge said. Macros can also be used to automate often-repeated tasks such as updating network software or temporarily changing port configuration parameters. It reportedly improves throughput by more than 25% on typical communications server applications.

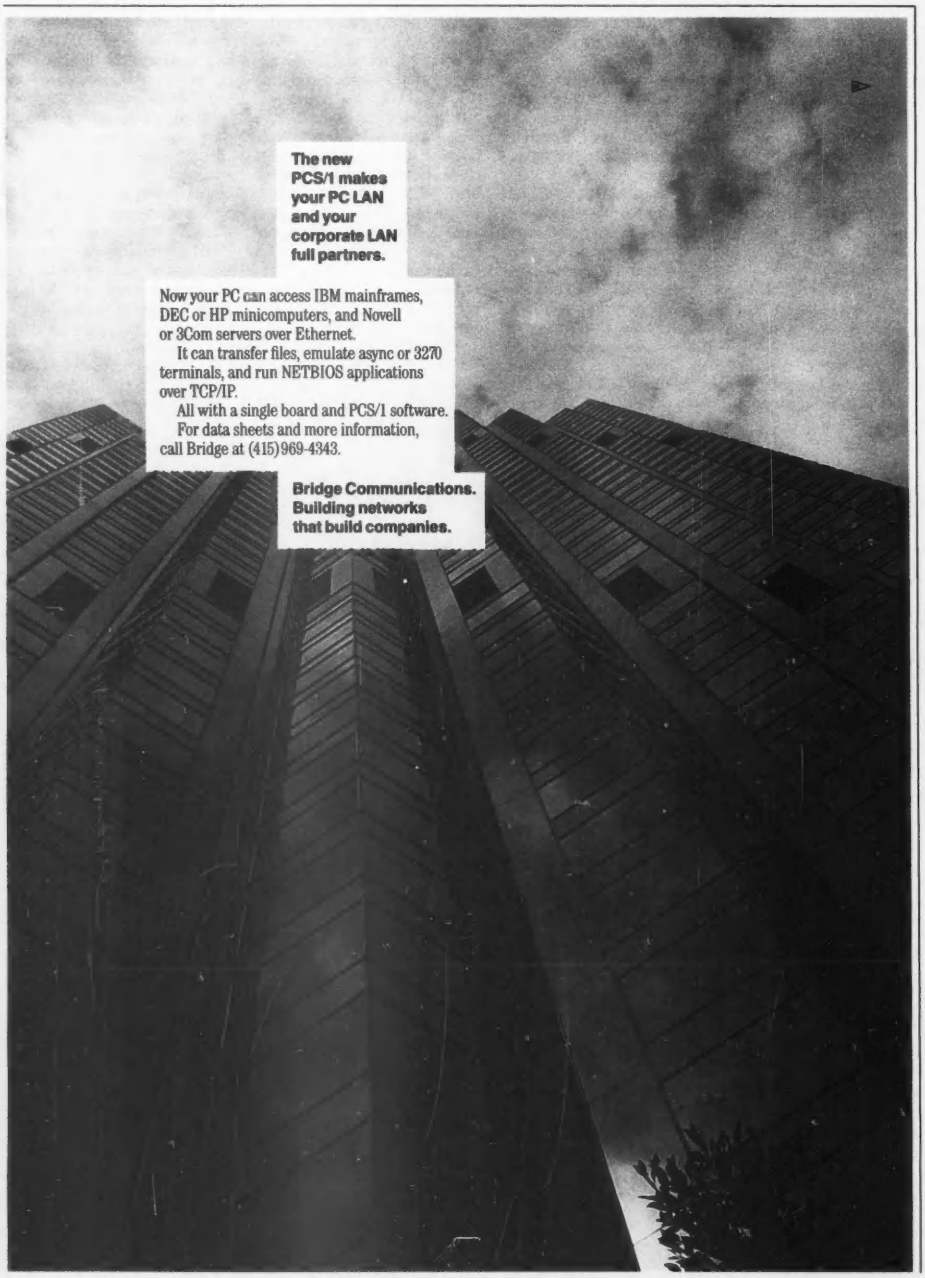
The 9.6K bit/sec. dial-up modem market has gained another low-priced entry. **Universal Data Systems,** a Motorola, Inc. subsidiary, recently announced plans to cut the price of its CCITT V.32-compatible modem by 36%, to $1,595. The product complies with the V.32 standard and supports full-duplex 9.6K bit/sec. transmission, the Huntsville, Ala.-based vendor said. The price will be retroactive for outstanding orders.

Prices on 9.6K bit/sec. dial-up modems may sink further as a result of a new modem board from **Rockwell International Corp.** that supports CCITT V.32 and V.22 protocols. The board, which Rockwell said it plans to sell to modem makers who can then incorporate it into their products, can communicate with any modem supporting one of the above standards running at speeds ranging from 300 to 9.6K bit/sec., the vendor said. It is quantity-priced at $450 per unit.

Intecom, Inc. has announced test implementations of the Integrated Services Digital Network (ISDN) Primary and Basic Rate Interfaces on its IBX line of private branch exchange systems. The Wang Laboratories, Inc. subsidiary recently announced Intecom DT124, a primary rate-interface card that allows IBXs to support up to 23 digital 64K bit/sec. channels over a T1 link; and the ISDN Station Interface, which will support 24 basic rate interfaces, each of which has two 64K bit/sec. digital channels. The DT124 is scheduled to ship in December 1988 and to cost $3,575. The ISDN Station Interface, priced at $11,900 per card, is scheduled to ship in May 1989, the vendor said.

Interchange Systems, Inc. has developed an enhanced Digital Equipment Corp. VAX version of Netpay, an electronic data interchange package that standardizes how financial institutions exchange documents. Netpay was originally developed as an IBM Personal Computer AT system that handled bank payments for General Motors Corp. and its suppliers. The current package is said to process the full range of documents supported by ANSI X.12 protocols. The system is priced at $125,000 and is scheduled to be available in this quarter.

The second edition of "A Program Guide for CIM Implementation" is now available from **The Society of Manufacturing Engineers** in Dearborn, Mich. The 280-page book provides guidelines on the "smooth and profitable transition to computer-integrated manufacturing," or CIM, the society said. Topics covered in the book's 21 articles include the latest CIM advances, justifying CIM, reculturing under CIM and implementing the Manufacturing Automation Protocol. The guide costs $33 for SME members and $38 for nonmembers.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Pacific Bell

CONTINUED FROM PAGE 69

Bell central office.

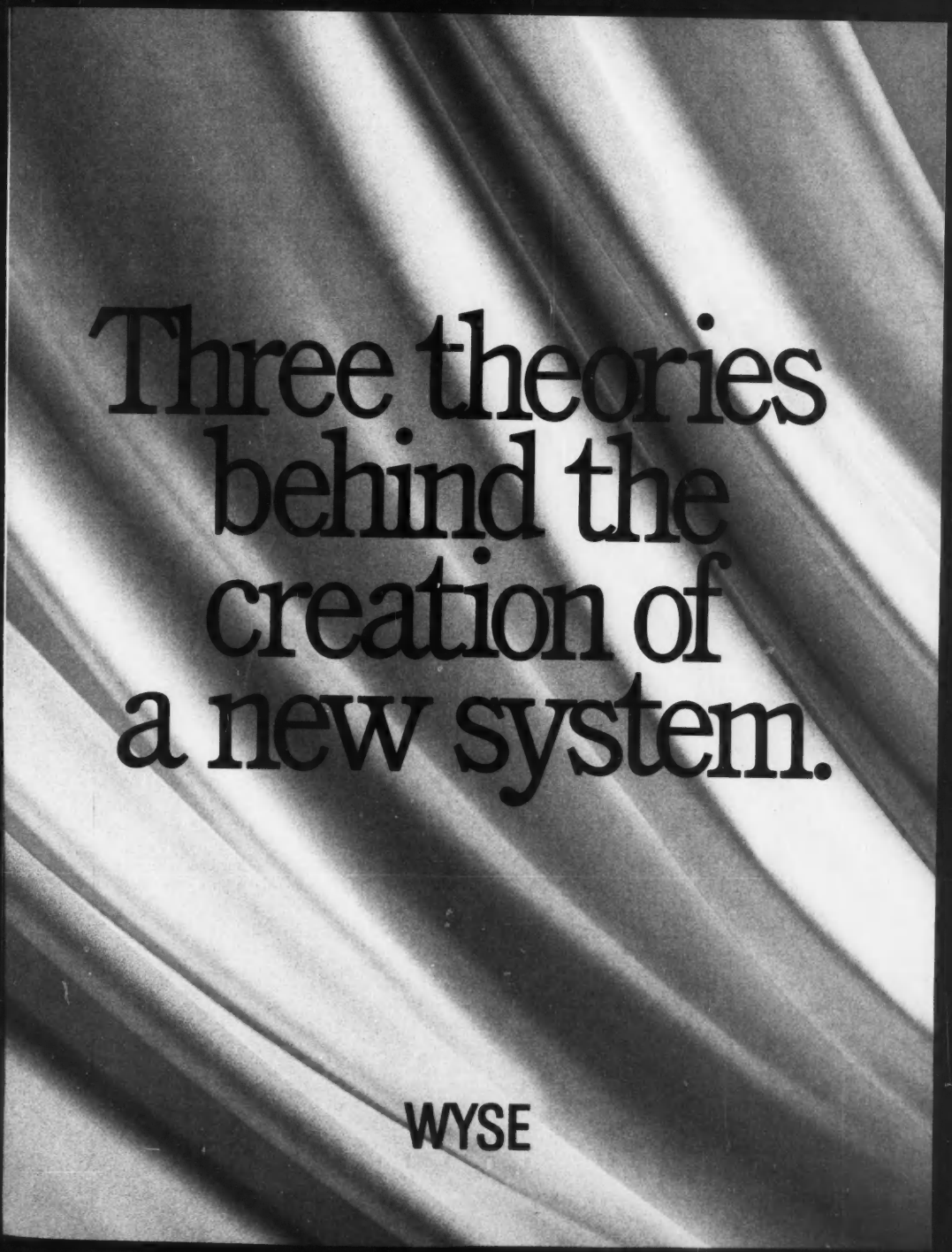
The San Francisco ISDN sites, scheduled to launch ISDN in December, will tap Pacific Bell's existing analog AT&T 1A ESS switch, which will provide digital transmission through an NEC NEAX-61E add-on box.

The ISDN trials do not preclude a later Pactel offering of Project Victoria, which will allow users to support up to seven voice and data channels on one telephone line, the vendor claimed. Pactel is still considering Project Victoria as an alternative service for users who want to interface a variety of voice and data devices on one line without investing in special ISDN boxes and interfaces, according to Pacific Bell spokesman Scott Smith.

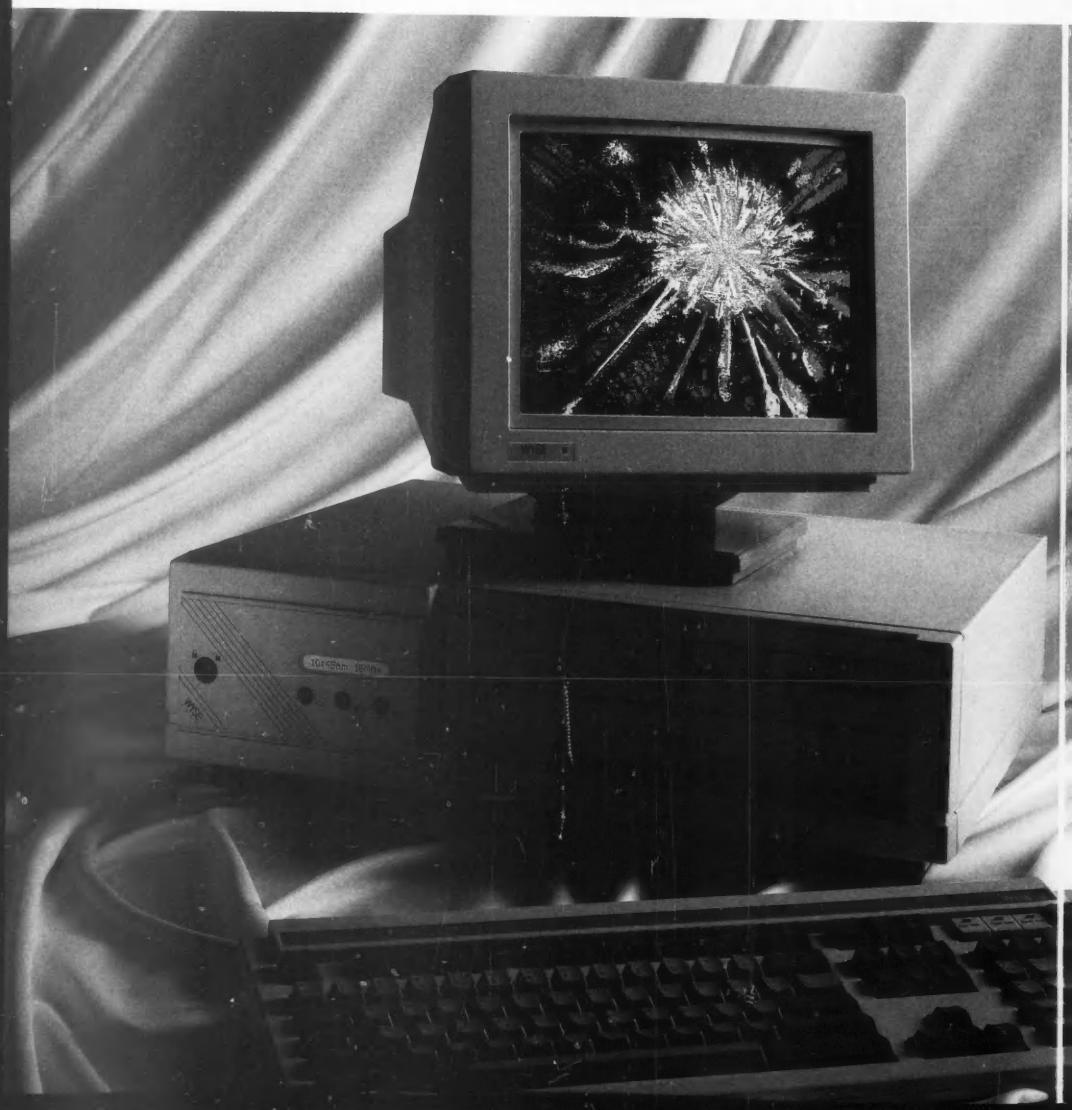
Pactel filed the original tariff for Project Victoria in June 1986 but later put the service on hold because of an FCC ruling that put a customer-premise equipment definition on the box that would interface user devices to the service. Pactel has filed a request for the FCC to review its decision.

"Project Victoria is designed to be an integrated system, and forcing us to sell the box through other vendors would be like asking customers to buy a complete radio except for the tuner, which they'd have to buy separately," Smith said.

The carrier said it expects an FCC decision by late November at the earliest.


Three theories
behind the
creation of
a new system.
WYSE

The Big Ban



ng Theory.

In the beginning, there was power. When Wyse engineers set out to create a new personal computer family, their objective was not merely to design a new system, but to design a new *design*. Criterion one was power with total compatibility: higher performance for industry standard operating systems and applications. Today's and tomorrow's.

Introducing SystemWyse,™ a comprehensive system for creating solutions. At its core are four new Wyse computers which set higher standards of performance for every level of PC user.

At the top, the new WYSEpc 386 has one of the highest benchmark ratings yet for a personal computer. Our unique design harnesses the 16 MHz 80386 microprocessor to achieve exceptional memory speed as well as processing speed. The result is a zero wait state system for high speed processing on multiple operating systems, such as MS-DOS,® OS/2,™ and Xenix.® As an engineering work station, a high power spreadsheet processor, a multi-user system, or a network server, it is a system to satisfy the insatiable.

The same Wyse design ingenuity maximizes the effective power of the 80286 microprocessor as well. In our 8 MHz general purpose 286, our 12.5 MHz professional desktop system, and our 12.5 MHz zero wait state high performance system. At Wyse, overachievement just seems to run in the family.

The WYSEpc 386 driving our VGA color monitor. WyseWindow™ LCD provides system status and activity readout.

WYSE

We make it better, or we just don't make it.

The Theory o

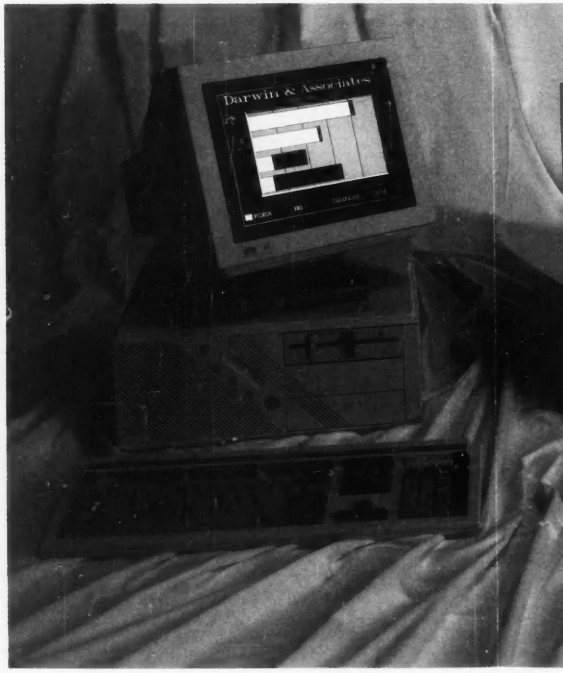
Survival of the system demands the ability to adapt to an ever-changing environment. Traditional PC design applied to most systems today virtually guarantees their extinction sooner rather than later.

It occurred to the Wyse engineering team that, with rapid change the only true constant, the intrinsic ability to adapt readily to new technology was essential in the ideal PC design.

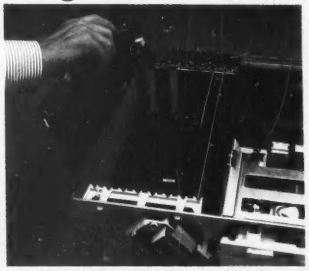
For example, by incorporating all active functions on plug-in cards, we could make upgrading or reconfiguring our computers literally a snap.

From this simple concept emerged the most practical PC design of the '80's —and 90's: the Modular Systems Architecture™ we developed for SystemWyse.

This new design gives PC purchasers, at last, a means to protect their investment against Dreaded Obsolescence. The CPU itself is a plug-in card. So, for example, you can upgrade our general purpose 8 MHz model to a 12.5 MHz high performance 286 machine—or even a 16 MHz 386—as easily as you'd add a graphics board to a traditional system. And when more powerful microprocessors are available, you'll even be able to boost the power of our top-of-the-line WYSEpc 386.



To achieve such flexibility, Wyse applied mini-computer design concepts to the internal architecture of our PCs. Our new passive back plane accommodates as many as 10 plug-in cards that perform all necessary functions, and then some.



It's this easy to upgrade CPUs—and boost the power—of a SystemWyse PC.

# of Evolution.

With total interchangeability. Wyse already makes available a wide array of graphics, memory expansion, and interface modules.

Our design also increases ease of repair and accommodates customized configurations *ad,* virtually, *infinitum.*

In a world in which survival belongs to the fittest, the only true survivors are those with the capability to remain fittest, longest. This is a theory applied with great practicality in SystemWyse.

Three SystemWyse graphics solutions: our 8 MHz desktop with a Wyse VGA monitor; our 12.5 MHz professional desktop and VGA color monitor; and our 12.5 MHz, zero wait state system driving the WY-700 hi-res graphics display.

WYSE

We make it better, or we just don't make it.

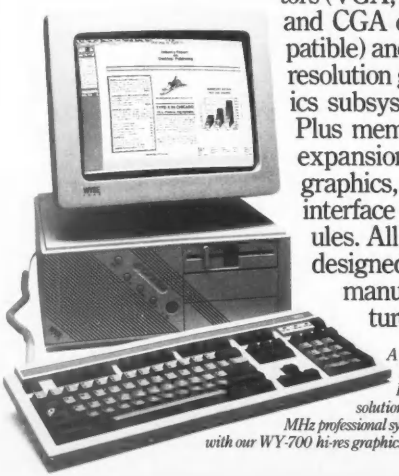
The Theory o

It all works together.

Most of all, SystemWyse is a system for creating solutions. Uniquely integrated solutions that range from desktop publishing installations and powerful CAD/CAE workstations, to 16-node multi-user systems. All are based on industry standard operating systems, with over 1000 *tested* applications available.

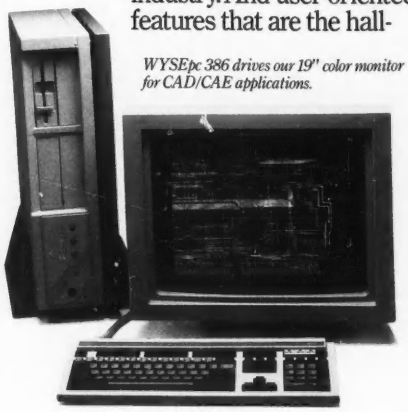
At the heart of SystemWyse are our Modular Systems Architecture computers. They're the most powerful PC family in the business. And, with more possible configurations, the most flexible.

But SystemWyse also encompasses an entire catalog of compatible, superbly designed peripherals. Including one of the industry's most popular lines of computer terminals. Color and monochrome monitors (VGA, EGA and CGA compatible) and high resolution graphics subsystems. Plus memory expansion, graphics, and interface modules. All are designed and manufactured by Wyse to link effortlessly, and work together in singular harmony.



A SystemWyse Desktop Publishing solution: our 12.5 MHz professional system coupled with our WY-700 hi-res graphics subsystem.

It's all driven by a unified design vision. That's why SystemWyse has a look and feel that's consistent throughout. Computers and terminals with identical screens and keyboards. Styling that has set a new standard for the industry. And user-oriented features that are the hallmark of Wyse design.



WYSEpc 386 drives our 19" color monitor for CAD/CAE applications.

Such as the advanced ergonomics. The crisp characters and high resolution screens of our terminals. The clarity and vivid colors that distinguish our monitors. The built-in help facility and simplified set-up menus of our systems.

Standing behind our ability to deliver on the promise of SystemWyse is our unique manufacturing capability. As one of the industry's most vertically integrated producers, we make all our own

# of Relativity.

products. And we make virtually everything from the ground up. While most companies use sub-assemblies purchased from someone else, we gain infinitely greater manufacturing control by beginning with components.

The result is a means to create solutions of manifestly superior quality and value. Solutions that are at once both elegant, yet relatively easy to construct. Solutions that seem custom designed for each specific application. We call them, simply, "SystemWyse solutions."

A WYSEpc 386 powered multi-user system, with our WY-60 alphanumeric and WY-99GT graphics terminals as work stations. All peripherals link to the system with simple telephone-type connectors.

WYSE

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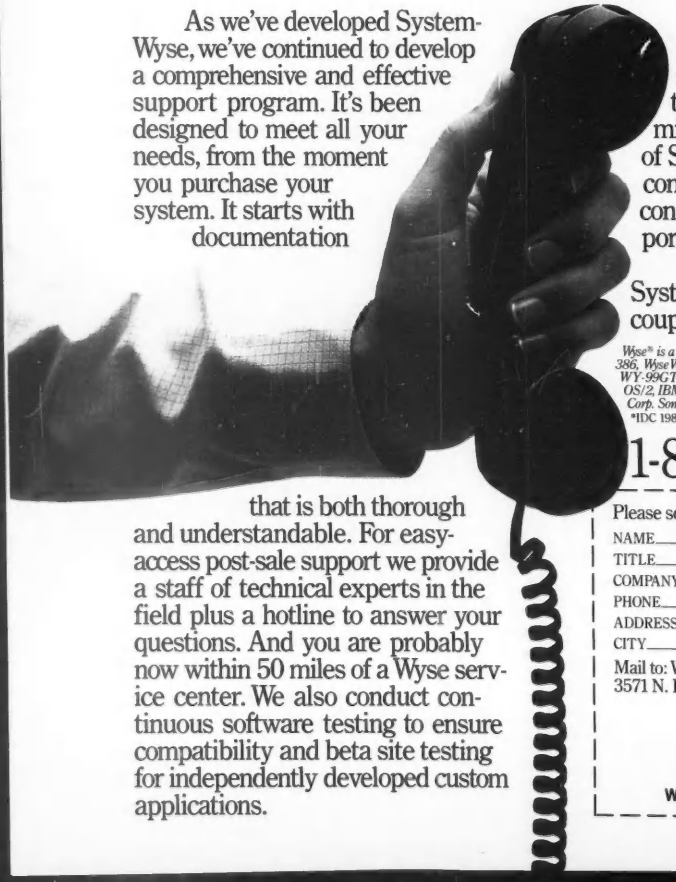
As we've developed SystemWyse, we've continued to develop a comprehensive and effective support program. It's been designed to meet all your needs, from the moment you purchase your system. It starts with documentation



that is both thorough and understandable. For easy-access post-sale support we provide a staff of technical experts in the field plus a hotline to answer your questions. And you are probably now within 50 miles of a Wyse service center. We also conduct continuous software testing to ensure compatibility and beta site testing for independently developed custom applications.

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Jumping ship

CONTINUED FROM PAGE 69

Network Architecture Gateway. "One of our goals is to ensure that any terminal can get to any DEC system," Lanzillo said.

The company's major reason for choosing DEC was that the vendor offered a consistent environment — the VAX/VMS system — for running both office automation and data processing applications, Lanzillo explained. "We also liked the way that DEC's office products worked on the VAX and the fact that you can easily build applications that use services like E-mail and word processing."

In contrast, IBM's Professional Office System office automation system will not easily run on the IBM CICS environment that Liberty Mutual currently uses for its transaction systems, Lanzillo said. In reference to Distributed Office Support Systems (Disoss), IBM's E-mail system, he said, "We looked at Disoss under CICS and found it was rather lacking in usability."

In general, the insurance company found that "the tools on DEC machines are just easier to use in the office," Lanzillo said. Liberty Mutual centralizes its technical support, providing none in the field.

"Our past experience with IBM systems tells us we couldn't continue to do this" with IBM departmental processors, Lanzillo added.

Standing firm

While IBM had not announced the 9370 when Liberty Mutual began its initial search for a departmental processor, "we have seen nothing at IBM to change our minds since," Lanzillo emphasized. The insurance firm is currently in the pilot phase of its DEC project.

As far as IBM's claims that the 9370 and its VM/SP operating system are easy to install and that the system can be operated remotely: "Seeing is believing," was Lanzillo's cynical reaction. "It hasn't been as easy as DEC said it would be to install and maintain their system, either."

Comparing IBM's and DEC's peer-to-peer architectures was not a major concern for Liberty Mutual, according to Lanzillo, since the departmental systems would be acting primarily as local file and application servers and as nodes in the company's E-mail network.

Retailers shop for EDI norm at conference

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Retailers met here last week at the National Retail Merchants Association (NRMA) conference to hammer out details of an electronic data interchange (EDI) standard. The standard, which has been under development for nearly two years, would provide a uniform way for department stores to place orders with their suppliers.

An NRMA committee met during the three-day Retail Information Systems Conference to finalize a 170-page draft titled "Retail Industry Conventions & Implementations Guidelines," which details record formats for purchase orders and invoices. When complete, the standard is expected to support an informal arrangement among major retailers to adhere to the ANSI X.12 protocol. The movement parallels developments in the automotive, aerospace and textile industries.

> "WE'RE TRYING to get everyone to accept the X.12 standard so that contacting them by computer will be as easy as picking up the telephone."
>
> MICHAEL BILOTTI
> ZAYRE CORP.

EDI is not entirely new to the retail industry, according to Michael Bilotti, director of corporate information services at Zayre Corp. in Framingham, Mass. "We've communicated with our suppliers electronically for years," Bilotti said. "But now, we're trying to get everyone to accept the X.12 standard so that contacting them by computer will be as easy as picking up the telephone." Before this, retail companies needed multiple links to communicate with suppliers.

But the need for EDI is just as great on the vendor side. Levi Strauss & Co. in San Francisco is using the technology to obtain purchase orders from J. C. Penney Co. and Sears, Roebuck & Co., said Tony Tse, manager of Levi Strauss's Information Resources Group. Glenn DuBois, manager of Levi Strauss's retail electronic services, who chairs the EDI committee, said, "The trend cannot be ignored. We have 500 people on our mailing list, including 60 chief executive offcers and 75 vice-presidents of MIS. They believe that EDI is becoming a way of doing business."

Many of the 1,900 NRMA attendees were curious about the applicability of EDI to their own operations. "This is a learning experience for me," said Harry Hastilow, director of information systems for Grenada Canada Ltd. in Rexdale, Ont., which leases and sells television sets. "We have 65 stores across Canada, and we're looking for new technology, such as EDI, to help us compete."

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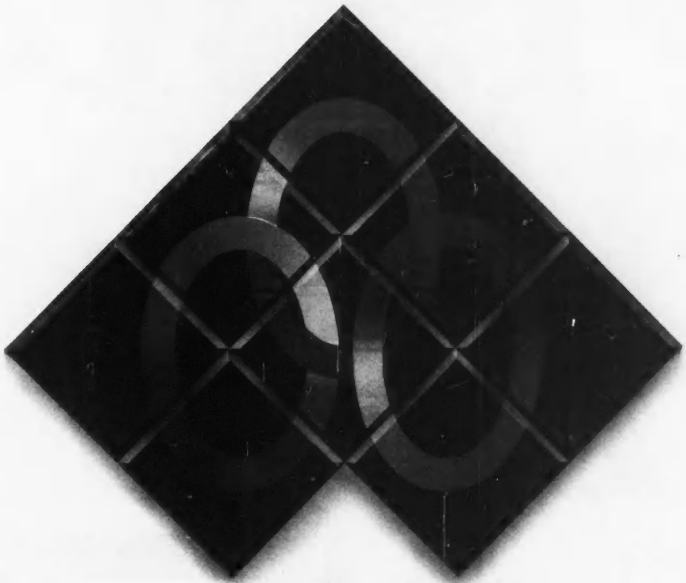

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Digital's networking gives our city's departments–police, fire, water, maintenance, planning, finance, the whole works–a way to share a wealth of data," explains Mr. Parks. One way Bellevue accomplished this was by creating an automated mapping system that's accessed right on the network. "We reproduced every inch of the

"Digital's networking is improving the quality of service in Bellevue and that's improving our quality of life."

city on electronic maps, allowing us to pinpoint problems instantly," continues Parks. "Whether it's fixing a broken main or dispatching emergency vehicles, we can respond faster and more cost-effectively. Plus, we've dramatically reduced the number of human errors."

Mr. Parks sums up what Digital is helping Bellevue accomplish. "We're using technology to touch the lives of 82,000 people every day." To find out what you can accomplish, write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742. Or call your local Digital sales office.

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Managing nets

CONTINUED FROM PAGE 69

or who fear IBM as networking dictator. It is not so good for MIS managers who are still looking for ways to control their multivendor networks from one centralized system. Networking standards are definitely an area in which "the more the merrier" does not apply.

Picture this

Of course, there is little likelihood that Timeplex and DCA will set up rival network management standards. A more likely scenario is that they will link their "standard" architectures to certain selected vendors' products on a case-by-case basis.

THE ADVANTAGE OF OSI is that while a company like AT&T can give it a boost by providing an early implementation, it cannot take control of the standard or jerk other vendors around by changing it.

For example, Racal-Milgo recently agreed to market DCA's T1 product line while the two companies work to get their respective network management systems talking.

However, proceeding on a case-by-case basis is time-consuming and will not meet the majority of users' needs the way a single, uniform set of protocols would. The real question is whether, and to what extent, networking vendors want to link up with their competitors.

"I don't believe the Timeplex approach [of opening up its architecture to others] is any good other than from a public relations point of view," says Avanti Communications Director of Marketing Charles Halquist. "Paradyne might say, 'Gee, I have more modems than you have muxes, why don't you code over to me?' "

Nor do vendors who have spent millions of dollars developing a graphics-based network management system want to turn that code over to a competitor, Halquist rightly pointed out.

A lesson learned

The Netview situation is instructive. Several vendors have denied any intention of going beyond a low-level interface that lets their systems send basic alerts to the host-based system. Integration on an application level — which would allow users to actually control networking equipment from Netview and collect data in a common data base — is not a major priority.

Users are pressuring vendors to provide that level of integration somehow, and the answer may be Open Systems Interconnect (OSI). AT&T gave the OSI network management standard a boost by promising to incorporate the protocols under its Unified Network Management Architecture (UNMA) and to make the system's specifications available to other vendors.

The advantage of OSI is that while a company like AT&T can give it a boost by providing an early implementation, it cannot take control of the standard or jerk other vendors around by changing it, as IBM could with Netview.

But here again we must question vendor motivation. Is it really in networking companies' best interests to convert to a uniform network management standard? Consider the fact that of the slew of network management announcements made over the last year, the majority aimed at improving the functionality and user-friendliness of proprietary systems.

This may please customers who want a single, easy-to-use system for managing one company's line of modems and T1 multiplexers, but it doesn't exactly promote the idea of an open net management network system.

'Sneaking suspicion'

Savvy users are well aware of this. TRW, once on the verge of committing to Netview, is now evaluating AT&T's UNMA — "except the OSI component is ambiguous," says Kenneth Jankowski, director of networking at TRW. "Will it be AT&T OSI or CCITT OSI? The sneaking suspicion here is that everyone can't become a vanilla vendor or they lose the capability to differentiate products." A more likely scenario, Jankowski says: "You could have several flavors of OSI, and 'compatible systems' can talk together but not exchange information."

The sad part of all this is that some MIS managers are getting discouraged and cynical. A former telecom manager at The Chase Manhattan Corp. remembers, "I tried to get a project going at Chase to do ubiquitous network management, with alerts from all devices showing up on one console, but there was no package and no vendor wanted to do it, and I couldn't cost-justify it."

That was a couple of years ago, but even now, the manager says, "Vendors want to keep customers with proprietary code. If a standard were published, anyone could OEM them. It would become a commodity market, open to [the equivalent of] Japanese imports."

Horwitt is a *Computerworld* senior editor, networking.

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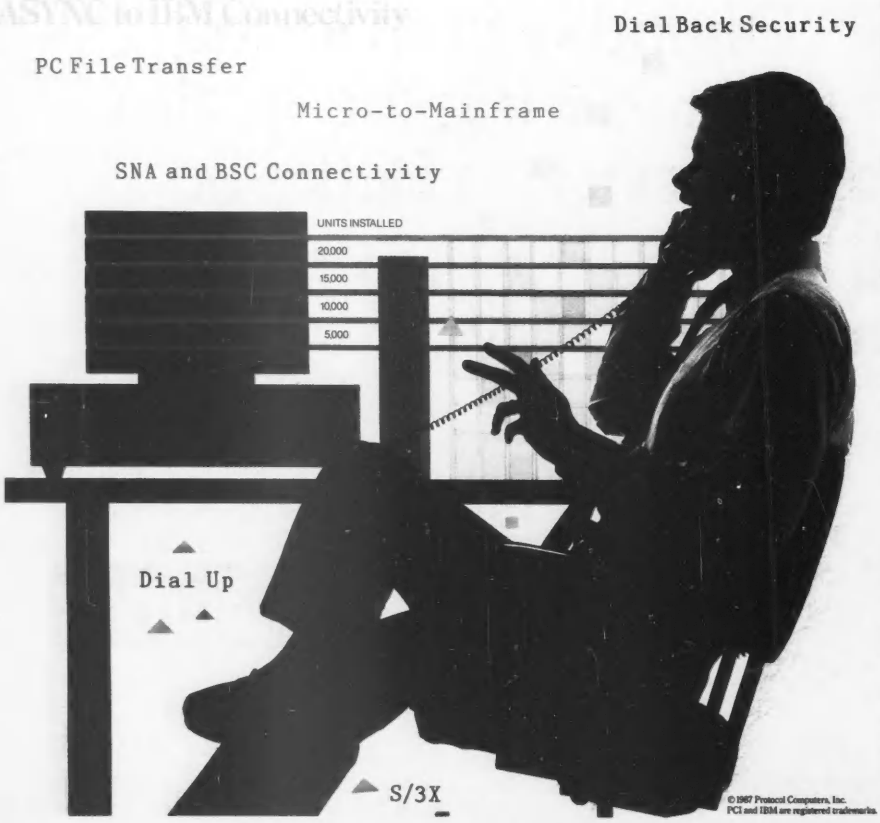

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Twisted-pair Ethernet juggernaut rolls on

BY ELISABETH HORWITT
and PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — On the eve of last week's IEEE standards committee meeting on the subject, announcements of actual or planned 10M bit/sec. Ethernets running over ordinary telephone wire continued to roll in.

The second meeting of the IEEE's 10Base-T study group was held Oct. 6-8 at the Embassy Suites Hotel here and was hosted by Micom-Interlan, Inc., located in Boxboro, Mass. Attendees were to prepare criteria for presentation to the IEEE's November Plenary meeting.

They were expected to include 3Com Corp. and Ungermann-Bass, Inc. in Santa Clara, Calif., Digital Equipment Corp. in Maynard, Mass., Wang Laboratories, Inc. in Lowell, Mass., and Synoptics Corp. in Mountain View, Calif.

Micom-Interlan, a supporter of this technology, said it is reviewing development options. "We are anxious to incorporate the data from the work group meeting and will be announcing our specific product plans within the next 30 days," it said in a prepared statement.

Quick off the line

Ungermann-Bass beat Micom-Interlan to the punch two weeks ago, joining the growing list of vendors to unveil a 10M bit/sec. Ethernet that runs over unshielded telephone wire.

The networking vendor also announced a joint development agreement with Hewlett-Packard Co. in Cupertino, Calif., to ensure interoperability between the two companies' twisted-pair products.

Ungermann-Bass's network will incorporate technology designed to eliminate the cross talk and outside interference that tends to plague high-speed twisted-pair networks over longer distances, the networking company said.

As a result, the network will support 10M bit/sec. data rates over unshielded twisted-pair connections of up to 330 ft between the workstation and wiring hub, the vendor said.

Scheduled for initial availability during the first quarter of 1988, the network will comply with IEEE 802.3 standards, Ungermann-Bass said. Currently, HP, 3Com, Synoptics and DEC have announced fast Ethernets over unshielded twisted-pair.

Market estimations

Some discussion at last week's 10Base-T meeting revolved around the estimated size of the market, as well as the need for standards.

Although Micom contended that Fortune 1,000 companies are demanding the 10M-byte performance of Ethernet without having to run expensive coaxial cable, 3Com is predicting a small market. "A very small fraction of total system revenue [much less than 5% of networking revenue alone] will flow from twisted-pair devices themselves," said Robert Metcalfe, 3Com's senior vice-president of technology.

In addition, Metcalfe suggested that twisted-pair Ethernet standards may not be necessary for three reasons, including the size of the installed base of twisted-pair, its variability and 3Com estimates that relatively few dollars will be spent on the twisted-pair transmission devices themselves.

"It is questionable in our minds whether Ethernet standards are needed for twisted-pair wiring," Metcalfe said. "If they are, we suggest that such standards not conflict with existing Ethernet standards and that they focus on the coexistence of Ethernet and other services, including especially voice, in existing telephone cables."

Gandalf package

CONTINUED FROM PAGE 69

speeds up to 64K bit/sec. over ISDN.

Network managers gain control of connections, transmissions, administration, maintenance and processing regardless of the transport technologies and computing communications standards in use, the vendor said.

Starmaster accommodates circuit, packet, synchronous and asynchronous traffic. All users and resources can be configured in a nonblocking network.

Communications paths between the sources of information and destinations are built on demand by network control and connect software. All necessary protocol and transport transformation is automatically switched into the path. Once a connection is established, data throughput cannot impact network performance, Gandalf said.

The software provides bandwidth-management techniques said to allow the network manager to centrally control transport performance and cost on both local- and wide-area transport facilities.

Starmaster's architecture consists of a series of interconnected high-speed digital buses supporting an aggregate throughput of more than 2G bytes. The basic unit is a digital connectivity control (DCC) bus and I/O buses.

The DCC bus has 65M bits of throughput capacity with nonblocking, full-availability access to each I/O bus and device. It provides up to 1,920 individual time-divided channels of 64K bit/sec.

Galdalf also announced Starsets, software configurations that provide the following functions:

- T1 transport over twisted-pair or fiber-optic lines.
- Statistical multiplexing of low-speed data onto digital or analog lines from 9.6K to 64K bit/sec.
- Up to 64 simultaneous session-shared Ethernet virtual connections per coaxial cable attachment.
- Time-division multiplexing for interconnecting multiple point-to-point synchronous links.

Mitek TCP/6.2 links System/36, 38 to TCP/IP network environments

CARROLLTON, Texas — Mitek, Inc. recently announced connections between the IBM System/36 and 38 and the Transmission Control Protocol/Internet Protocol (TCP/IP) networking environment.

TCP/6.2 consists of a control unit that links a System/36 or 38 to a TCP/IP-Ethernet network and application software that allows the IBM departmental processor to communicate with other TCP/IP devices on the network.

The System/36 or 38 can act as a host that is accessible to any device on the network that runs the TCP/IP terminal-to-host protocol, Telenet. Alternatively, it can exchange files with other systems using the TCP/IP File Transfer Protocol, Mitek said.

The network controller emulates IBM's 3174 cluster controller architecture and implements PU2.1 and LU6.2 peer-to-peer protocols in order to communicate with TCP/IP applications residing on the host, according to Mitek software developer Herb Collins.

The price for a System/36 or 38 interface, including both the software and the hardware controller, starts at less than $20,000. General availability is scheduled for the first quarter of 1988.

IBM is said to have an agreement with Mitek to demonstrate the products on a worldwide basis.

Mitek already offers a TCP/IP-Ethernet interface for IBM 370/MVS systems.

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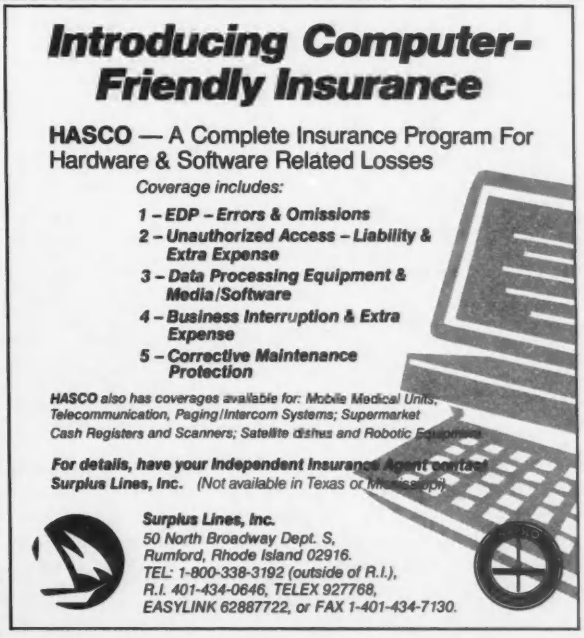
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NEW PRODUCTS

Local-area network hardware

The **Model 4990 Remote Control Unit** microprocessor-based remote switch controller has been announced by **Data Switch Corp.**

Designed to centrally control monitor or bypass switches as remote sites, the Model 4990 supports up to 512 switched lines, provides remote access to monitoring and test functions and displays alarms from remote switches.

The Model 4990 controls up to 256 lines of monitor or bypass switching. It has two RS-232 ports.

Pricing starts at $2,000.

Data Switch, One Enterprise Drive, Shelton, Conn. 06484. 203-926-1801.

Local-area network software

Communications software packages said to allow networked IBM Personal System/2s and Personal Computers as well as compatibles to drive high-speed line printers have been announced by **Network Software Associates, Inc.**

In an IBM Systems Network Architecture network, micros equipped with the **Fastprint** software are said to operate as remote-site printing nodes communicating with a central host mainframe.

3274/Fastprint runs on a PS/2 or PC attached via coaxial cable to an IBM 3274 or 3174 cluster contoller. 3770/Fastprint runs on a PS/2 or PC equipped with an IBM Synchronous Data Link Control adapter board.

3274/Fastprint is priced at $985. 3770/Fastprint costs $785.

Network Software, 22982 Mill Creek, Laguna Hills, Calif. 92653. 714-768-4013.

Links

Two products designed to enable multiple personal computers at remote offices to access IBM System/34s, 36s and 38s have been added by **Ideassociates, Inc.**

The **Ideacomm 5250/Remote Gateway** was designed for offices with IBM Netbios-compatible local-area networks (LAN). The **Ideacomm 5250/Remote Share** was designed for offices with multiple stand-alone micros.

The 5250/Remote Gateway allows up to four gateway servers per LAN. The 5250/Remote Share allows four remote PCs to access the minicomputers via one emulation board.

A complete 5250/Remote Gateway package costs $1,775. The 5250/Remote Share package costs $1,395.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821. 617-663-6878.

NEW AT INFO '87

A four-module, integrated, open architecture voice and text communication system was announced by **Zymacom, Inc.**

Called the **Zymacom Automated Communication Hub** (ZACH), the product uses existing telephone or private branch exchange wiring and office automation equipment. It features voice and electronic mail, audio text, automated attendant, productivity tools, speech synthesis and microcomputer LAN capabilities.

ZACH costs from $24,500 to $137,000.

Zymacom, 2 Liberty Way, Westford, Mass. 01886. 617-692-4500.

Digital Pathways, Inc. announced its **Securelink X.25**, a host-independent product said to allow an organization to guard CCITT X.25 packet links against unauthorized access.

The product acts as a security gate, screening any access requests made to the connected host. Access control is based on the user security profile stored in Securelink X.25. A single Securelink can protect up to 32 virtual circuits.

The product is priced at $12,500.

Digital Pathways, 201 Ravendale Drive, Mountain View, Calif. 94043. 415-964-0707.

AT&T enhanced its Audix voice-mail systems and its Accunet Switched 56-based teleconferencing services.

Audix II software allows systems to be connected in a digital network with up to 100 remote Audix locations. An Audix Standalone option allows users of most private branch exchanges to use the Audix system.

The **Accunet Switched 56 Digital Broadcast Capability** (DBC) allows users to stage teleconferences, including video, graphics and computer-aided design applications, connecting up to 24 locations. AT&T also announced the **Alliance 3000** interactive teleconferencing service, allowing users at up to 59 locations to send and receive digital data and graphics images at 56K bit/sec.

Audix II software costs $100 supporting up to 2,000 users and $500 supporting up to 4,000 users. Audix Standalone costs $42,000 with 10 hours of storage and four ports. Accunet DBC costs 30 cents per min. for each location served. Alliance 3000 Service costs 50 cents per min. for each location participating in digital communications and 25 cents per min. for each audio location.

AT&T, 100 Southgate Pkwy., Morristown, N.J. 07920. 201-221-2694.

You're looking smarter than ever, MIS!

JCPenney Company's MIS department shares the inside story on creating a successful Executive Information System using an outside data service.

"We've actually had department heads from throughout the corporation walk into MIS and say, 'Hi! I like what you're doing and we need to get on your system.'

"All in all, I'd say we're on the right track," says Bill Friel, Vice President of MIS for JCPenney Company.

With a modest "We're on the right track," Friel sums up the tremendous success of JCPenney's Executive Information System (EIS), *now serving over 30,000 users.*

What's the secret to their success? And how can you make your department look as good when designing *your* system, the most visible MIS activity since introducing PC's to the Executive Suite?

The secret is that there's no secret at all.

Robert Capone, Senior Vice President and Director of Technical Operations, explains that when the EIS was designed in 1983, "We already had an extensive internal network. Our problem was how to improve the value of our existing decision support system.

"The obvious answer was to provide more of the information people really need. That meant adding external data, which led us to Dow Jones News/Retrieval®."

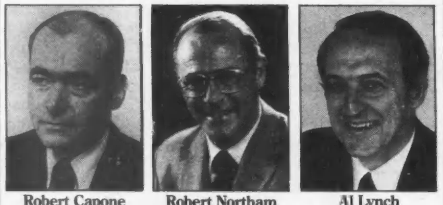
Take the "easy way out."

Capone found that Dow Jones News/Retrieval offered an easy, economical way to integrate reliable external data.

"It's there, the systems exist. It's easy to integrate. It's not very expensive—less now than when we installed it. And it fits the needs of a very broad user base," he says.

Dow Jones News/Retrieval is an online information service of Dow Jones & Company, Inc., publisher of *The Wall Street Journal*. It offers over 40 business and financial databases, including exclusive online access to the full text of *The Wall Street Journal*.

Capone remembers, "We experimented with various means of dial-up connections, but they were not convincing."



Robert Capone Senior Vice President — **Robert Northam** Chief Financial Officer — **Al Lynch** Director of Planning and Research

"You're looking smarter than ever, JCPenney," is more than advertising, it's how users throughout the company view their MIS department, and the EIS they've created. Dow Jones is a major reason it rates above average.

To guarantee absolute reliability, JCPenney Company pioneered the technology for connecting to Dow Jones via a dedicated line and worked out an attractive pricing structure.

Other corporations, such as ConAgra and IBM, have followed their lead.

"It wasn't very difficult at the time," Capone says. "Today it would be even simpler."

What are the users saying?

Capone uses the service daily as a kind of executive security blanket. "I take a few minutes in the morning to look at the headlines and make sure I'm well informed. It really starts the day off right."

But what do others outside of MIS think of the decision to bring Dow Jones News/Retrieval inside?

JCPenney's CFO, Bob Northam, agrees wholeheartedly: "It's very timely and simple to use. In meetings, I can easily call up figures for immediate on-the-spot analysis."

Al Lynch, Director of Planning and Research, calls it ". . .one of the most powerful tools in our system. Thank goodness for the corporate insider trading data. It showed us some things that influenced a major deal. It can pay for itself very quickly."

Heather May, a coordinator for new business activities in Lynch's department, uses Dow Jones News/Retrieval because ". . . I believe in gut reaction. When my instincts say 'go to Dow Jones,' that's where I go. It sounds like habit, but there's a reason it became habit: I've found it works."

"It's a definite necessity," says Raul Consunji, a financial analyst at the company. "There's a lot of credibility in the name 'Dow Jones,' and no way to get along on the job without it."

Holly Clemente, manager of the Investor Relations Department adds, "This is a great way to obtain information quickly. Without it, everything would be done manually, and that shouldn't be the case in this day and age."

An MIS story that always ends happily. Well, almost always.

Properly planned and implemented, an EIS is an almost sure-fire coup for MIS.

But it can quickly turn into a fiasco if just one element, such as timely external data, is overlooked.

Dow Jones News/Retrieval can help guarantee your success, giving users the information they can *really* use.

Capone sums up the bottom line: "I didn't have to promote it; the system sold itself. You put it up, and what's not to like?"

That's the kind of "selling" most MIS/DP executives would love to be faced with. ■

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Computer equipment lessors are learning to look beyond rates to service options, contract terms and contract conditions.

RISKS, REWARDS IN LEASE GAME

BY EDITH MYERS

LARRY ASHTON

Ron Othick, vice-president of International Minerals & Chemical Corp. (IMC) in Mundelein, Ill., is typical of a new breed of computer leasing customer — more sophisticated, more demanding of service and more savvy about how to negotiate a good deal for his company. Othick says his company spends $3 million a year on leasing and considers itself to be getting good value. "[Leasing companies] give us a lot of assistance, and we don't have to come up with up-front capital. There's plenty of room for negotiation," he explains. "Ten years ago, we used to rent from IBM on a month-to-month basis. We wouldn't consider that now."

But primarily, what Othick looks for in a leasing company is something that cannot be written into a contract — the assurance that the leasing company will be there for him if his machine runs out of steam and will replace it quickly.

Othick says some leasing companies will write into their contracts meaningless phrases like, "We will attempt to . . ." But, he says, "The greatest comfort comes from knowing the people [at the leasing company] and the company's track record." Othick also looks at the company's history and its past financial performance.

Like most customers, Othick is aware of the impact the tax law changes are having on the leasing industry and of the trend toward consolidation of companies in the business. So far, he says, these factors mean a better bottom line, and he is not overly concerned about price hikes.

Despite dire predictions to the contrary, the computer equipment leasing business is doing well in this, the first year of tax reform, and leasing prices are holding the line. The used equipment business is also flourishing as companies seek to cut costs and improve financial liquidity.

In fact, some say that changes in the tax law, such as the repeal of the investment tax credit (ITC), have flushed some dangerous elements out of the industry and enhanced leasing's attractiveness. "ITC was forcing many into the position of selling tax benefits, which was not a business we wanted to be in," says Ken Bouldin, chairman of Econocom-USA, Inc., a Memphis-based leasing company. Bouldin, also chairman of the government relations committee of the Computer Dealers and Lessors Association (CDLA), observes, "It attracted people to the business who were interested only in selling tax benefits, and they've gone away. [The removal of the ITC] has gotten the sharks out of the water."

Tom Abramosky, a Hermosa Beach, Calif., computer consultant who advises clients on buy-or-lease decisions, says the major effect of losing the ITC has been "less incentive to purchase."

Right now, leasing companies are managing to keep leasing rates stable, even though their acquisition costs are higher. Tom Martin, president of Computer Financial, Inc. in Hackensack, N.J., says he believes end users are getting better deals because lessors are managing to keep rates down, even without the ITC.

"The biggest savers are nonprofit organizations like governments or health care providers," he says. "[These users] never had the ITC, and

Myers is a free-lance writer based in Hollywood, Calif.

Lease

FROM PREVIOUS PAGE

they're getting the same advantages as other users from the methods used by leasing companies to keep rates in line."

Whether the smooth sailing will continue is debatable, however. Bob Gulko, president of Sausalito, Calif.-based Unicom Computer Corp. and chairman of the CDLA, expects the ITC will come back eventually, noting, "It's come and gone six times since 1962." In the meantime, he says, rate hikes should be anticipated. "It's a very rare leasing company that has had to pay any taxes," he says. "Now they'll pay, and this will translate to higher rates."

Playing the future

To keep rates stable this long, lessors have been playing a high-stakes game, gambling that they can improve profit by assuming a high resale value for equipment that comes off lease.

Most leases being written today are so-called operational leases. In these, lessors base their rates on retrieving 70% to 80% of their investment in equipment from a first lease and making additional money on the residual value when the equipment is resold or re-leased.

"It's a game of risk and reward," says Richard Forsythe, president of Forsythe McArthur Associates, Inc., a lessor and dealer company in Skokie, Ill. "Often, there are higher values to used equipment at the end of a lease than anticipated. That's luck, not smart planning."

"Leasing rates have not risen because the larger players are taking more aggressive residual-value positions, which definitely puts them at more risk," observes Stephen Josselyn, project manager of shared resource systems at International Data Corp. (IDC), a Framingham, Mass.-based research firm.

Bob Neagle, vice-president of Bell Atlantic Capital Corp., adds, "Leasing companies staying in the business need expertise in predicting very specifically the future value of the equipment they lease. They have to really understand the equipment."

Not a crystal ball

Forecasting residual values is an inexact science. Ralph Page, a senior appraiser specializing in high-tech equipment at Marshall & Stevens, Inc., a Los Angeles-based company, says, "We try to look at the future in terms of what has happened [to the equipment] in the past, using a curve procedure to estimate future values. And we factor in the possibilities of new technology."

David Wolff, vice-president of El Camino Resources in Sherman Oaks, Calif., says forecasting residual values is "like trying

Continued on next page

How lessors benefit under new tax law

BY SHAWN HALLADAY

By now everyone is familiar, to some degree, with the major provisions of the Tax Reform Act of 1986. Yet, even as we move more deeply into the first year of this legislation, confusion still lingers around both the applications and consequences of certain aspects of the law.

Because of this confusion, the full impact of the act has yet to be seen. One thing that can be said with certainty is that computer leasing will remain popular as portions of the new law, such as the alternative minimum tax and the mid-quarter convention, are added to the other, unrelated to tax, reasons to lease.

The changes in the law, as they relate to computer leasing, can be seen in four areas.

Corporate break

The first is the drop in corporate tax rates from 46% to 34%, effective July 1. This drop alters the aftertax cost of debt for lessees as well as leasing rates. As a result, the cost of acquiring computers has gone up.

To the extent that a lessor's borrowing costs are different from those of the lessee who is acquiring the computer, the lease vs. buy decision will be affected, with the lessor's lower borrowing costs making the lease look more attractive. For example, with some leveraged leases, this decline in rates provides significant tax breaks, since depreciation deductions are recognized at higher rates than the "turnaround" of income, resulting in lower leveraged lease costs for lessees.

A second change — and one that is even more obvious in its impact — is the repeal of the investment tax credit, which became effective Dec. 31, 1985. A major incentive to purchase and own new computer equipment no longer exists. Potential acquirers of computer equipment must look at leasing more closely now that the major impetus for buying equipment has disappeared.

From a quantitative perspective, while the cost of buying in lease/buy decisions has gone up substantially, leasing costs have not increased, even though they should have.

Another major shift in the tax system is the modification of the Alternative Cost Recovery System for tax depreciation, which became effective Dec. 31, 1986. The alterations include changes in class lives, rates and deduction calculation methods.

The depreciable life of a computer is still classified as five years, but because of a change in computing yearly depreciation (to a 200% declining balance), it must now be depreciated over six years instead of five.

Interestingly enough, although the depreciation period lengthened under the new law, the actual depreciation accelerated somewhat. Under the old law, 37% of the computer equipment could be written off during the first two years, but with the new law, 52% can be written off during the same period.

This year, acceleration is accentuated by the declining tax rates. This change affects leasing as lessors adjust their rates downward to reflect tax benefits and increased depreciation during the same year.

A new twist in the law, called the mid-quarter convention, affects computer acquisition. Under this, if a user purchases more than 40% of its equipment (including equipment of any type acquired by the corporation) in the last quarter, it must use a different depreciation method.

This method, which is not only a bookkeeping nightmare but also lowers the value of depreciation in that year, is a decided tax deterrent for buying.

The mid-quarter convention, however, applies only to equipment that is purchased, not leased. It is plain, then, that leasing provides a mechanism to avoid the lowering of depreciation value.

By properly matching its own year's end with that of the lessor — and avoiding lessors who themselves are in the mid-quarter penalty — a lessee can obtain the most favorable rates. This is another factor to be considered in the lease vs. buy decision and one that will certainly cause those wishing to acquire equipment to consider leasing in a more favorable light.

The hardest tax

All aspects of the new tax law will affect the decision to lease or buy, but none is as difficult to comprehend and apply as the new alternative minimum tax (AMT). While simple in theory, this provision represents one of the most complex and pervasive changes in the law.

The concept of the AMT is that all corporations will pay at least some minimum level of tax. The tax itself is based on combining regular taxable income with certain preference items. This total is multiplied by the AMT rate of 20% to derive the tax.

Preference item is an Internal Revenue Service code term for certain devices, such as accelerated depreciation, business untaxed reported profits and certain tax-exempt interests, that are used to reduce taxes. Many corporations may not pay regular taxes because of their deductions, but after adding back their preference items to regular taxable income, they most likely will owe an AMT. Because the AMT or the regular tax, whichever is greater, must be paid, it is obvious that a corporation would want to avoid being an alternative minimum tax payer.

The two preference items of major concern to lessors and buyers of equipment are accelerated depreciation and the pretax book-income preference.

- **Depreciation preference.** Any excess of regular depreciation over the 150% declining balance must be added back to the regular taxable income as a preference. This reduces the benefits of depreciation to purchasers of computer equipment.
- **Pretax book preference.** One-half of the excess of a corporation's pretax book income above its AMT income must also be added back into regular taxable income as a preference. This preference affects both purchasers and lessees.

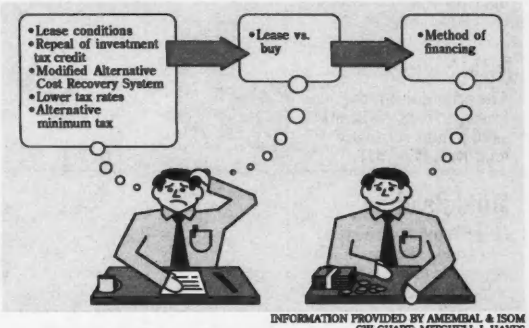
The lease vs. buy equation becomes incredibly complex under AMT, because now the potential lessee must know exactly what its AMT position is and then integrate that position into the analysis. Many acquirers, however, will find it advantageous to lease because leasing equipment does not create the depreciation preference. Leasing, in effect, becomes a means to avoid AMT or to more quickly bring a lessee out of an AMT position.

In this respect, leasing can be expected to grow as lessees take advantage of this tax planning alternative. •

Halladay is executive vice-president with Amembal & Isom, a lease education and consulting firm in Salt Lake City.

The lease vs. buy decision process

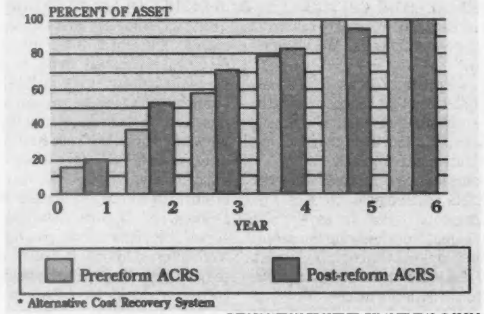
When weighing ownership against rental, consider tax implications as well as terms and conditions



INFORMATION PROVIDED BY AMEMBAL & ISOM
CW CHART: MITCHELL J. HAYES

Cumulative depreciation and tax reform

Modification of the ACRS for tax depreciation has lengthened the depreciable life of computer equipment but accelerated early write-offs*



* Alternative Cost Recovery System

INFORMATION PROVIDED BY AMEMBAL & ISOM
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The alternative minimum tax (AMT)

Measuring lease/buy impacts in light of the AMT

	Lease	Buy
Depreciation preference	No	Yes
AMT exposure?	Lower	Higher
Pretax book income preference (operating lease)	No	Yes
AMT exposure?	Lower	Higher

INFORMATION PROVIDED BY AMEMBAL & ISOM
CW CHART

Lease

FROM PREVIOUS PAGE

to forecast the stock market." He says some companies will use residual forecasting as a financing vehicle. "They take an aggressive front-end rate and hope to make up the difference when the equipment goes out for release." The package is offered with a predicted residual value that may or may not be inflated.

What users must understand is that the risks in preserving the current rate structure are not all on the lessor's side. In some cases, leasing contracts contain provisos that cushion the risks for leasing investors and drastically inflate costs for the lessee at the end of the term.

Josselyn warns users to watch for indemnification clauses that could penalize them if the value of the equipment at the end of a lease is less than the lessor had expected and if investors stand to lose money.

Untangling the contract

Charlie Greco, group president of financial services at IDC, also worries about indemnification and advises users to "review [leasing] documents with a fine-tooth comb." Greco says terms that might make users liable for investor loss should be negotiated out of the contract.

> TO FORECAST residual values is "like trying to forecast the stock market."
>
> DAVID WOLFF
> EL CAMINO RESOURCES

Companies like IMC that do a lot of leasing tend to keep close tabs on published residual-value forecasts. Othick says, "If residual values in a contract don't match up with published values, it is a negotiating point." Othick says he lets leasing companies know that he will not countenance contracts tying him to residual value or investor losses and has not yet had a potential bidder back away because of this.

Marshall Roberson, vice-president of MIS at American Capital Management & Research, Inc. in Houston, buys as well as leases equipment. When leasing, he says, he identifies future residuals to determine the rate he thinks he should get. Like Othick, Roberson wants low rates and protection if the quoted residual is high. He says he does not worry too much about low quotes for residuals except that "they generally mean higher rates."

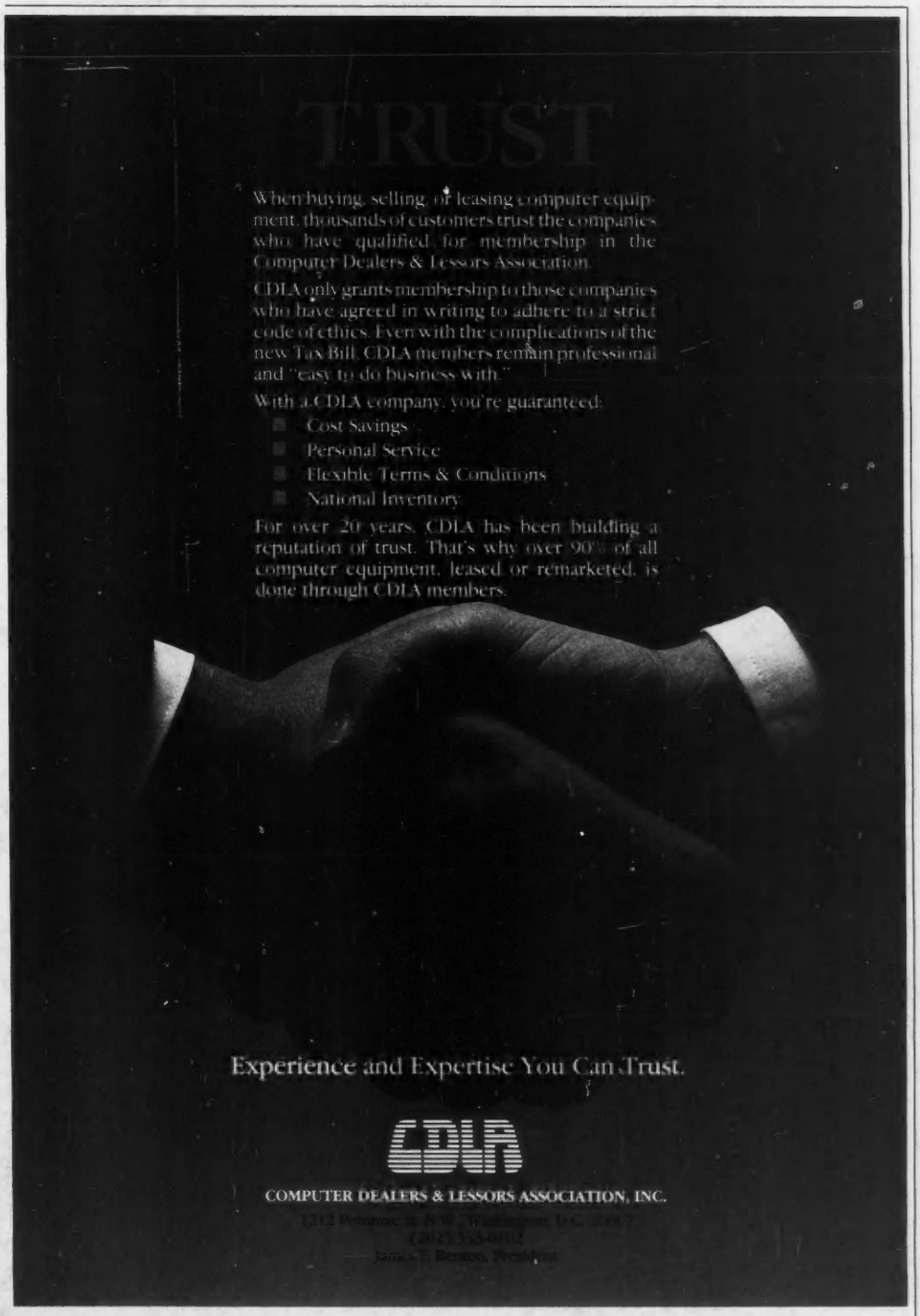
Will the bubble burst?

There is good reason, beyond the immediate issue of their impact on leasing rates, to scrutinize residual value forecasts, according to Computer Financial's Martin. He says he worries about packages in which residual values are inflated and warns, "This may be the next big bubble bursting, the next big scandal."

Martin contends there are those who, putting together leasing packages for investors, "go for as high a residual value as they can get, shop around for the highest numbers and then use these in their offerings."

It is income fund investors that Martin is most concerned about. In its quest for capital, the leasing industry is looking, to an increasing extent, to the private sector — to so-called income funds. "These are growing in

Continued on page 6


TRUST
When buying, selling, or leasing computer equipment, thousands of customers trust the companies who have qualified for membership in the Computer Dealers & Lessors Association.
CDLA only grants membership to those companies who have agreed in writing to adhere to a strict code of ethics. Even with the complications of the new Tax Bill, CDLA members remain professional and "easy to do business with."
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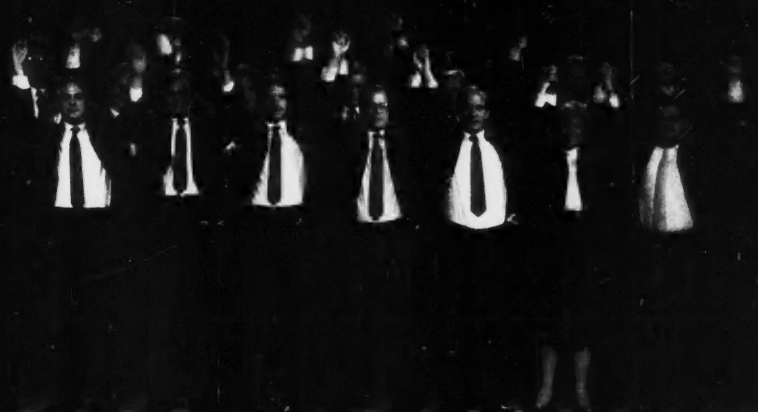


Lease

FROM PAGE 3

popularity," Martin says, "because they offer a good return on investment, and they're not tax sensitive. They seem to offer high yield to individual investors, but do they?"

At the end of seven to 10 years, these investors could end up with a lower-than-expected or even negative yield. "In the short term, this can mean good deals for users," Martin says. "But in the long term, it can prove bad for the industry and, consequently, bad for users."

CDLA President James Benton compares income funds with mutual funds. "They're designed to appeal to individual investors or a group of, say, 200 doctors," he says. "They're enormously complex, and they're driving [lease] rates down" by assuming higher residual values.

'Consolidate or die'

Consolidation is another factor that could affect the way bargaining takes place within the leasing industry. Benton says his organization has identified 41 acquisitions or mergers that have taken place in the last four years. The most recent, and one of the largest, was the acquisition last August of Bloomfield Hills, Mich.-based CMI Corp. by Continental Information Systems Corp. (CIS) in Syracuse, N.Y.

Harvey Goetzmann, chief executive officer of the merged operation, foresees a continuing merger trend. "There have been a fair number of smaller companies trying to go public and unable to raise the money. Larger companies are seeing the value in some of the capabilities of these small firms."

Harvey Kinzelberg, chairman of Meridian Leasing Corp., known in the industry as the Meridian Group, in Deerfield, Ill., says, "It's a question of consolidate or die. I've seen many small companies try, without success, to go public, only to end up looking for someone to sell out to. I believe there will be only eight to 10 major leasing companies worldwide by the end of 1989."

IDC's Greco sees the consolidation trend as "good for everybody. It's good for the user because he is dealing with bigger companies with more stability and net worth."

> "THE END user is getting a better deal. . . . We're bidding right to the edge."
>
> TOM MARTIN
> COMPUTER FINANCIAL, INC.

User wins

Forsythe is one who does not believe there is a trend toward consolidation in the industry. He says the CIS-CMI merger is the only real one-on-one consolidation. "The rest have meant a change of shareholders, companies redeploying their financial assets or attempting to diversify," he says. "But within the leasing operations, it's the same salesmen doing the same jobs."

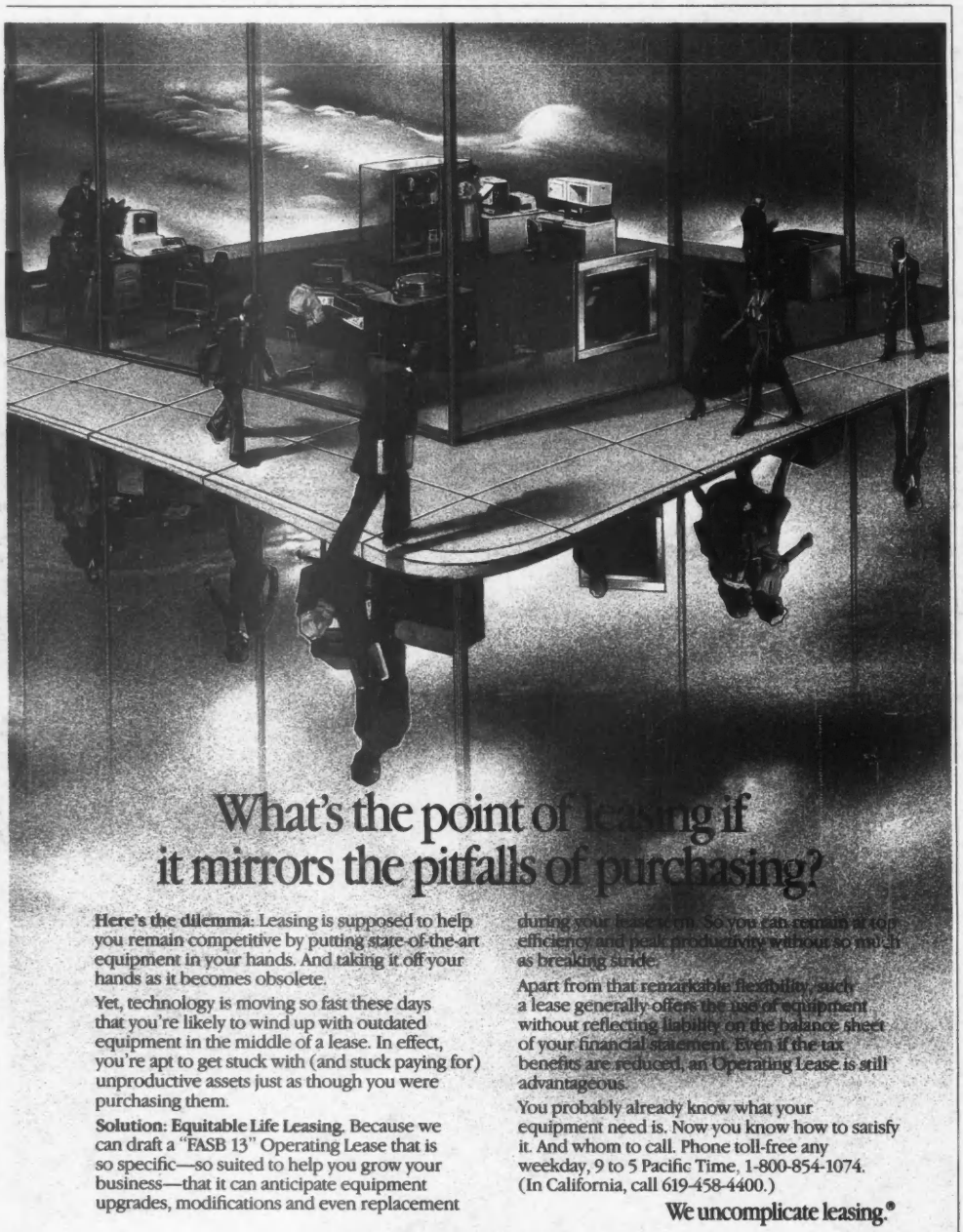
Forsythe, however, sees the acquisitions as contributing to competition. "It's causing the business to be extremely competitive. There's a profit squeeze for some, but it's good for our customers. They like it."

"The end user is getting a better deal," Martin says. "All bidding in the marketplace is aggressive. We're bidding right to the edge."

"We're a maturing industry," says Svend Hartmann, president of Chappaqua, N.Y.-based Computer Merchants, Inc. "Increased competition is to be expected. Customers are definitely getting better deals. There are people out there who will quote almost anything."

Some users are aware of the competition and are using it to their advantage. "We don't want to put all of our eggs in one leasing company's basket," says a Pennsylvania health firm's MIS director. "It's our current philosophy to have three to four leasing companies involved in our account at any given time. It spurs competitive bidding."

Jim Brown, vice-president of MIS at American Honda in


What's the point of leasing if
it mirrors the pitfalls of purchasing?
Here's the dilemma: Leasing is supposed to help you remain competitive by putting state-of-the-art equipment in your hands. And taking it off your hands as it becomes obsolete.
Yet, technology is moving so fast these days that you're likely to wind up with outdated equipment in the middle of a lease. In effect, you're apt to get stuck with (and stuck paying for) unproductive assets just as though you were purchasing them.
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Gardena, Calif., says, "At the beginning of each year we make a list of qualified bidders [for computer equipment leases]. That's not to say we wouldn't entertain a new company during the year. For any given transaction, we get four to five quotes. [The competing bidders] all know but we didn't suffer that loss."

There are other reasons Othick prefers leasing. "Most companies of our size who buy equipment need two full-time people to acquire and dispose of equipment. We let leasing companies do that for us," he says.

Flexibility has a different definition for Dick Hudson, director of MIS for Houston-based Global Marine, Inc., which filed for Chapter 11 bankruptcy in 1985. Global Marine is an offshore drilling company that is still suffering "from what OPEC did to the price of oil," Hudson says. "Between 1978 and 1982, we grew to a $500 million-a-year company, and from 1982 until now we've gone to losing $200 million a year. Flexibility has been very important to us."

In 1983, Hudson remembers, "We had a new 3083 we couldn't afford and really couldn't use. We asked to get out of our lease, facing a possible $100,000 penalty. [El Camino Resources] said I could keep it in my shop until they could place it. They worked night and day for me."

Hudson continued paying $40,000 per month on the 3083 leases but never paid a penalty. The 3083 was replaced "within a couple of months by a 3033 that was bigger and faster and only cost me $7,000 a month. I went from 3 MIPS to 5 MIPS at one-seventh the cost," he says, referring to the million instructions per second rating.

Two considerations in lease-or-buy decisions have not changed much in recent years — the financial condition of the company and at what position the desired product is in its life cycle.

Victor Janulaitis, whose Los Angeles computer consulting firm, Positive Support Review, Inc., advises clients on lease-or-buy decisions, says, "If the product is at the front end of its life cycle, and if the cost of capital to the client is less internally than it would be externally, then I would say there might be reason to buy."

At the end of a product cycle, he says, "A good deal can be had on a second lease. The leasing company's made most of its money on the first lease. This is a good way to go if you just need raw computing power."

American Honda's Brown agrees that life-cycle timing is important in a lease-or-buy decision. "Early in a product life cycle, it is probably better to purchase," he says. "Beyond that, leasing affords flexibility and often general service you can't get any other way."

Some do, some don't

American Capital Management's Roberson, who has chosen to go mainly with leasing used equipment, responds to dictates from his firm's parent company, Primerica Corp., when he makes a lease-or-buy decision. "We have to adhere to stringent cost-justification policies," he says. "We've looked at the cost of new systems and figure we can lease used for half the price."

Roberson says he also likes the ease of upgradability afforded by leasing used equipment. "One of the things we do at the outset is identify potential upgradability needs. With leasing, we figure we can upgrade two or three times for less than what it would cost to upgrade once with purchased new equipment."

There are, of course, always users who would never consider a lease. Jim Harper, director of MIS at Ameron, Inc., a Monterey Park, Calif.-based conglomerate with nine manufacturing subsidiaries, is one of these. He says he buys used equipment, particularly peripherals, whenever he can "because I can save a lot of money.

"Why lease?" he says. "Leases are expensive, particularly operating leases, and I can usually use a CPU over its entire life cycle." Moreover, he says, he likes to be in on the beginning of a life cycle.

"We find that many companies have a definite philosophy about whether or not they will employ state-of-the-art equipment or whether they are willing to remain one generation behind," says Faye Star, vice-president of marketing at San Francisco-based Decimus Corp. She feels two of the main nonfinancial benefits of leasing are avoiding technological obsolescence and the need to manage the asset.

AMT: Asset or liability?

Star, like many others in the industry, cites the new Alternative Minimum Tax (AMT) as an incentive to lease rather than buy. This is a citation that worries CDLA's Benton, who is concerned that AMT has been perceived in some quarters as a hidden tax loophole.

Under the Tax Reform Act of 1986, depreciation on new equipment can be treated as a tax preference item and can contribute to a company's being subject to AMT. Leasing costs, on the other hand, are treated as an ordinary business expense and do not contribute to AMT.

Benton, in a letter to *The Wall Street Journal* in which he responded to a March 12 article headlined, "Surprise loophole: Firms expect leasing to save them millions under new tax law," argues: ". . . leasing costs have been deductible as a business expense since the first income tax bill was enacted in 1913."

"There is no loss to the government in taxes," Benton says. "Somebody pays, be it the lessee or the lessor. [The AMT] is not a loophole." But Benton's is an argument in favor of leasing — and an argument lessors are using and lessees are considering.

The AMT is also adding to the popularity of what is known as a sale leaseback, in which users sell equipment they have previously purchased and then lease it back to avoid the AMT. "There's always been a lot of this," Meridian's Kinzelberg says. "The tax law has contributed to an increase, but so has the fact that a lot of companies are restructuring financially, acquiring more cash."

Know what you want

There are many things users should know before leasing computer equipment or buying used equipment. California Consultant Abramosky says specificity is most important. "Know exactly what it is you want to buy or lease, what it has to do, what configuration you want, how long it needs to be useful," he counsels.

> "KNOW exactly what it is you want to buy or lease, what it has to do, what configuration you want and how long it needs to be useful."
>
> TOM ABRAMOSKY
> CONSULTANT

In the personal computer area, Abramosky feels users should lease to get hands-on proof of performance. "If a machine isn't everything you thought it would be, you can usually get out of the lease," he says.

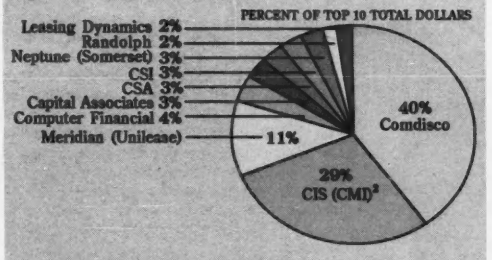
Abramosky tells of a client using IBM Personal Computer ATs who wanted a faster system and was considering buying a Compaq Computer Corp. Deskpro 386. He advised the client to lease instead. "He benchmarked the Compaq against the AT and decided he really wanted it. He'd leased long enough to apply the payments to purchase," he says.

David Kasparian of Analytical Solutions, a Canoga Park, Calif., consulting firm specializing in strategic planning for equipment configuration, says he asks clients facing the lease-or-buy decision, " 'In a few years, would you want something else? How critical is the piece of equipment to your operation?' "

Kasparian says he feels leasing today is more advantageous and should be considered if changes are contemplated. If the application is not critical to the company's operation, used equipment is worth considering.

Like others, Kasparian sees financial position and technology as key components of the lease-or-buy decision. "Unless you're cash-prosperous, there's no point in paying interest and no

Top 10 computer dealers and lessors[1]



Dealer/Lessor	Jan. to Aug. 1986 rank	Jan. to Aug. 1987 rank
Comdisco	1	1
CIS (CMI)	5 (2)	2
Meridian (Unilease)	6 (3)	3
Computer Financial	4	4
Capital Associates	8	5
CSA	—[3]	6
CSI	—	7
Neptune (Somerset)	— (10)	8
Randolph	—	9
Leasing Dynamics	—	10

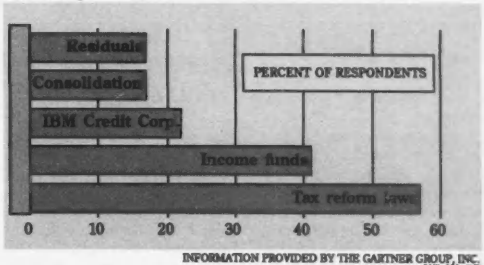
[1] Numbers based on Uniform Commercial Code Initial Filing data
[2] Parentheses indicate companies absorbed in mergers and their previous standings
[3] Not ranked in 1986

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

Rankings of the top *dealers and lessors, based on estimated dollar volume of business, reflect the climate of acquisition and consolidation in the industry. Comdisco continues in the No. 1 position, but the rest have shifted considerably since last year. CSI moved up from fifth place when it acquired CMI, which had been the No. 2 company. Other mergers made room for five new entrants.*

Leasing industry's key issues

Figures taken from Computer Dealers and Lessors Association's 1987 survey



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they're in competition, and we get the best quotes that way."

El Camino Resource's Wolff says he is not so sure where the consolidation trend will go. "Our business is traditionally entrepreneurial," he says. "I wonder about the potential for inflexibility in some of the new structures."

The flexible user

IMC's Othick, like many users, puts flexibility right up there with price as a reason to lease instead of buy.

"[The leasing companies] give us a lot of assistance in swapping out equipment in the middle of a lease. We can roll over [equipment] with either no increase in payments or a very minor increase, or maybe even a reduction," he says.

"We had an IBM 3090 Model 200 on lease," Othick recalls. "We'd had it for a year when we decided we didn't need all its capabilities. Meridian got us a 3084 with equivalent power, and we reduced our payments from $95,000 to $45,000. The 3090 had dropped in value over a year,

sense in owning technology even if you want to maintain a state-of-the-art position."

Kasparian says there are two kinds of people concerned with owning up-to-the-minute technology: those who want to show off and those who really need the equipment to do software development. "They'll lease, and as soon as the next [computer] comes out, they'll want to get it. This is easier done when leasing than when buying," he says.

In buying used equipment, Kasparian often advises technically savvy clients to buy a system no longer being manufactured and to buy more than one so that one can be cannibalized for parts. "They're usually so cheap that it's well worth the trouble if there is a technical person around who can do the cannibalizing," he says.

On the other hand, Kasparian warns clients who lease equipment, "Don't take it apart or modify it without permission."

> GONE ARE the days when the guy bidding a $120-a-month lease over a $130-a-month lease wins automatically.
>
> CHARLIE GRECO
> INTERNATIONAL
> DATA CORP.

It's in the relationship

Simply having established relationships can pay off in many ways. The MIS director from Pennsylvania says, "I purchased a 3090 Model 200 in March 1986 when it was at the beginning of its life cycle. It worked out well for us. Now, I'm selling that to one of the leasing companies as a straight asset sale with title transferred, and I'm purchasing a new 3090 Model 300 rather than go with IBM's field upgrade."

In doing this, the MIS director is upgrading for minimal cost. The difference between what he is paying for the new machine and what he is getting for the sale of the old one is less than what he would have to pay for a field upgrade. He feels it was his well-established relationship with the leasing company that made this possible.

The company knew of a possible home for the outgoing machine and, at the same time, was aware of his need for a new one and was able to put the two needs together.

"Relationships are the key," El Camino Resources' Wolff agrees. "We're right there with the customer all the time. We know ahead of time when an upgrade will be needed, and we plan for it. We also can work with them on riding out new announcements.

"Prices of new equipment can go down very quickly, as has happened with the 3090s. On the other hand, prices of old equipment can go up, as with the 3380 disk drives and the 3084 mainframes. We help customers deal with the question of old-new vs. old-old and the critical issue of timing," he adds.

More for the money?

Leasing is becoming a service-driven business. Many leasing companies consult with companies on issues like conversion, installation and switching architectures, IDC's Greco points out. Most good leasing companies are as familiar with their customer's needs and problems as are the customers themselves. The lessors can foresee a need for an upgrade or the onset of overcapacity and help the customer prepare.

In the competitive climate they face, dealers and lessors are also tending to offer more value-added services. Forsythe McArthur and Decimus hold seminars for customers on issues such as strategic planning and disaster recovery. Wolff says his company consults with customers on planning, budgeting, equipment recommendations, hardware configurations and strategic planning, adding, "We don't just react to customer needs."

Greco says leasing companies must do this to survive, and, as a result, the customer benefits. "Users are a lot smarter today than they were 10 years ago. Gone are the days when the guy bidding a $120-a-month lease over a $130-a-month lease wins automatically. Today's user will go for the $130-a-month rate if he thinks he is getting more for his money," he says.

"We also offer entertainment, like golf outings," Forsythe says. "We want to get across the idea that we're fun to do business with."

Just the basics, please

Some users are skeptical about the worth of value-added services. "Some of them even offer to pay for insurance," the Pennsylvania MIS director says. "I tell them, 'Thank you, but the only value added I'm interested in is a lower lease rate.' "

But others like and expect extra service. American Honda's Brown likes leasing companies that work closely with him in planning. He has high praise for Unicom, from which he leases mainly peripherals and some PCs. "[Unicom] has been outstanding in its work with us, in helping us meet our needs and counseling us on how to meet them."

Global Marine's Hudson says the consulting he received from El Camino Resources was important to his company both in its growth phase and into and through its Chapter 11 period.

In addition to adding value, companies are adding different lines of equipment for both leasing and used equipment offerings. IDC's Greco sees telecommunications equipment as the primary addition for most lessor-dealers, although he says this is still embryonic.

Many companies are adding new equipment lines to protect themselves from sluggishness in the mainframe market. For the user, these additions can mean having a single source for equipment needs. It is not an IBM-only world for most users, and their telecommunications and DP needs are coming together. So it must be for lessor-dealers.

A 1986 survey conducted by IDC and CDLA lists the value-added categories that lessors offer in order of popularity: personal computers, automated teller machines and other banking equipment, telecommunications equipment, computer-aided design/manufacturing equipment, point-of-sale equipment, software, graphics hardware, factory automation equipment and medical hardware.

Dave Mirsky, vice-president of lessor Capital Associates International, Inc., says his company is branching out into Storage Technology Corp. equipment and telephone systems. Wolff's firm is also involved with telecommunications equipment and has done some leasing of specialized test equipment.

"Everybody in our industry is broadening their horizons," Unicom's Gulko says. His company is involved in communications equipment as well as office systems.

"We've always been into other than computer equipment," says Meridian's Kinzelberg, whose firm deals in rolling stock, aircraft, robotics and telecommunications.

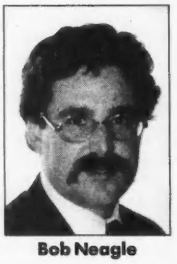
Software leasing, often mentioned by lessors as an emerging area of diversification, is said by Greco to be one step from the embryonic stage. Most lessor-dealers say they are dipping into software leasing and see it as a coming trend. For example, Dataserv, Inc. last spring acquired a noncontrolling interest in Software Funding International, Inc., a 2-year-old software leasing organization.

"There are many issues to be resolved," Greco says, "but it is happening." •

Smaller firms find a niche

Offering one-stop shopping seems to be the goal of most major computer equipment lessor-dealer organizations today. But even the largest firms have trouble covering every base, and that leaves room for innovative little guys.

Bob Neagle, vice-president of Bell Atlantic Capital Corp., characterizes the lessor-dealer market as one of "whales and minnows" and emphasizes that there's room for the minnows.



Bob Neagle

"For the large companies, there isn't enough money to be made with small transactions," he says. "There's plenty of room for small companies there." This is good news for small and medium-size users and for the big ones who only want to dabble in leased or used equipment.

Svend Hartmann, president of Computer Merchants, Inc. in Chappaqua, N.Y., says smaller companies can and are doing well in niches. "They're specializing in banking terminals, communications controllers and display stations. They're specializing right down to print mechanisms for IBM printers."

A case in point is 12-year-old East West Computing, Inc. in Los Altos, Calif., a specialist in IBM 3505 card readers and 3525 card punches. Owner and President Bob Pearson admits to being on the trailing edge of technology. He also acknowledges that his current specialty won't last forever, but he says he can and will change.

Pearson deals a lot with other dealers and leasing companies that can't be bothered with his kind of equipment. He says he learned early that small dealers need to specialize either geographically or through their products.

Jim Brown, vice-president of MIS at American Honda in Gardena, Calif., deals with a number of the larger lessor-dealer organizations. But when he wanted some specialized IBM 8100 equipment, "I went to a small company in Georgia," he says. "It's the only thing they do, and they know the equipment well."

Mike Wolfe, the 26-year-old president of Century Computer Brokers, a Culver City, Calif., used equipment dealer, changes his specialty according to the needs of his customers. A year ago, it was terminals; today, it's printers. "A good printer is a good printer, whether it's new or used," Wolfe says.

He says his main customers — and his main source of inventory — are large users. "Sometimes we get in the door with a sale, then find they have equipment to unload, and we buy it. Other times, it's the other way around."

Xyrtin Xolutions, Inc. (pronounced "Certain Solutions"), a Long Beach, Calif., systems integrator specializing in Data General Corp. systems, buys printers from Century. Price is one reason, but delivery is more important. "We get them more quickly than we can from DG," equipment sales manager Vaughan Densley says. "With DG, it takes weeks to get the paperwork done."

There are NCR Corp. specialists, too. Bill Pickens, DP manager at Smith Management Corp. in Salt Lake City, is a member of the Information Products Advisory Committee of the Federation of NCR User Groups. He says many of the federation's members lease equipment from third parties. He did in a previous job and "had some problems with software because NCR changed some methods. But the problem was solved, and the vendor ate the cost."

Vaughan Densley

Stan Lauck, of Current Looart Press, Inc., a Colorado Springs publisher of greeting cards, is president of the Honeywell Large Systems User Group. "I don't have a really good feeling as to how many of our members lease or buy used equipment from third parties, but I would guess a significant number of them do."

Then there are companies that specialize in leasing personal computers, Computer Merchants' Hartmann says, one of which his firm recently bought. "Business in used PCs is virtually nonexistent because the dollars aren't there," he says. "But leasing quantities of PCs is more prevalent than most people imagine."

EDITH MYERS

The soft(ware) touch

BY NINAMARY BUBA MAGINNIS

When the Milwaukee-based Oster Division of Sunbeam Corp. needed a new order processing system for its IBM 4341 computer, the consumer products manufacturer decided leasing the software would make sound financial sense.

"We just prefer to finance and pay for the software over the time we'll be using the system rather than put the cash out ahead of time," says Virgil Wuthrich, controller for the division.

While leasing hardware is old hat, leasing software is a relatively new phenomenon — but one that could become an industry trend, according to Karen Kugel, program manager for computer services at International Data Corp., a Framingham, Mass.-based market research firm.

"Software leasing wasn't done before because the status of software as a computer industry product didn't have the same kind of weightiness it has now," Kugel says. Until recently, she explains, software was regarded as an intangible asset, and its net worth was pegged to the cost of the medium on which it was stored — as opposed to the importance of the function it performed.

As a result, even very sophisticated programs were considered to have no value beyond the four or five dollars represented by the tape or disk.

"Banks now realize the importance of software and its high value compared to hardware in a lot of cases," Kugel says.

Enter the third party

Most small software houses do not have the financial backing to lease packages to customers, Kugel notes. So third-party firms like Software Funding International, Inc. (SFI), a Deerfield, Ill.-based company, are making software leasing arrangements for customers. Some traditional hardware leasing firms are also investigating the possibility of offering software leases, she adds.

SFI, founded in 1985 as one of the first software funding firms, can finance software leases from more than 300 vendors nationwide, offering operating leases of a kind that were once available only to hardware leasing customers.

With a software operating lease, which requires vendor support and must follow Federal Accounting Standards Bureau regulations, customers can expense 100% of the monthly software payment as an off-balance-sheet transaction, notes Kraig Kleeman, SFI's director of sales operations. "That way," he says, "it doesn't show up on the books as a liability."

Through SFI, Oster is planning to lease an order processing system from the Atlanta-based software vendor Management Science America, Inc., according to Wuthrich. Oster usually borrows money to finance inventory and other assets, which may include software. By leasing its software through SFI, Wuthrich says, the company will be able to finance it at competitive rates.

Because SFI teamed last spring with Eden Prairie, Minn.-based Dataserv, Inc., a Bell South Corp. company and IBM equipment leasing, maintenance and parts supplier, the firm can now offer one-stop shopping for complete systems, SFI's Chairman and Chief Executive Officer David Smoot says.

The arrangement gives companies funding options heretofore unavailable in the computer industry. HG Toys, Inc., a $60 million toy maker and subsidiary of the Long Beach, N.Y.-based HG Industries, Inc., for example, wants to upgrade its IBM System/36 computer to a System/38. The firm decided that leasing both software and hardware from one vendor would make doing business easier.

HG Toys plans to lease the IBM hardware and a third-party manufacturing resource planning software package from SFI, according to Robert Reh, HG Toys' vice-president of information services.

Leasing the system and services from SFI will eliminate the usual dollar outlay for software purchases. "The obvious advantage is cash flow," Reh notes. "The cost is more with the interest charge, but you can spread the cost of a project over a long period of time.

"Companies today try to operate in as lean a position as they can," he continues. "We want to use cash flow for daily operations as well as pay off the lease on hardware and software." ■

HG Toys' Reh YVONNE HEMSEY/ GAMMA LIAISON

Maginnis is a free-lance writer based in Webster, Mass.

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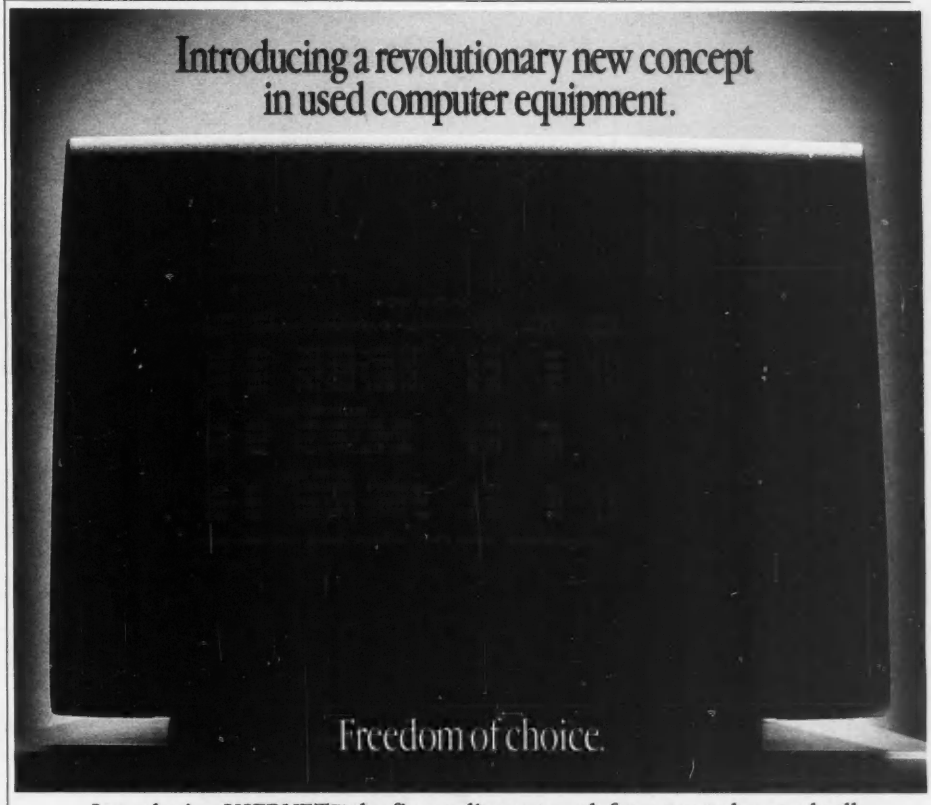

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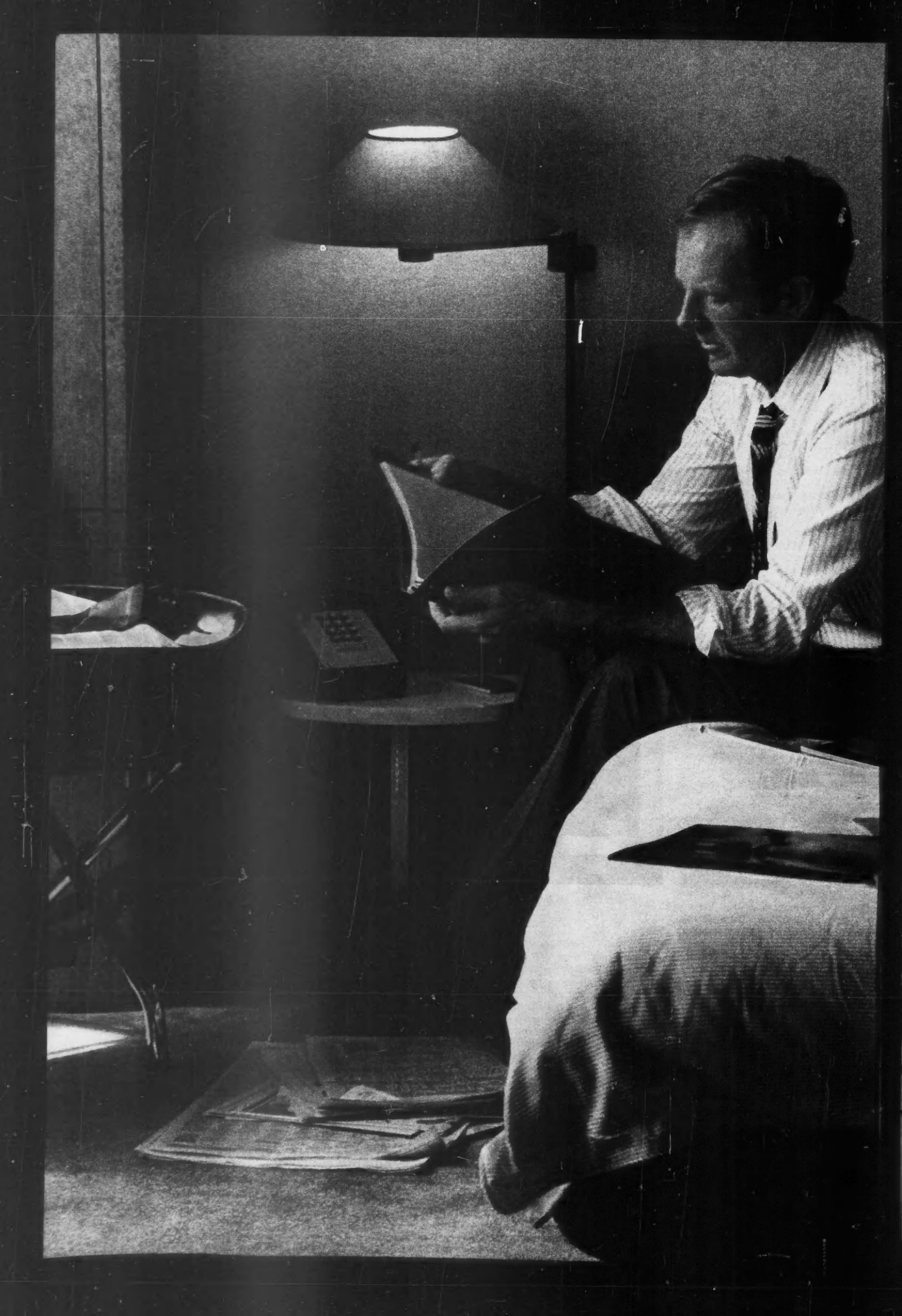

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Increasing machine longevity helps leasing industry to thrive

BY WALLY PAPCIAK

The computer leasing industry will be a viable long-term business, basically because of IBM's evolutionary product strategy and because machines are becoming more reliable and maintainable each year. A competitive maintenance industry also helps keep IBM from setting prices that would encourage migration to the latest products.

One way to track the flow of the leasing and used equipment markets is to analyze Uniform Commercial Code Initial Filing (UCC1) data. All states except Louisiana maintain these files, which are used to register financial liens for equipment collateral and to establish ownership of a piece of leased or financed computer equipment.

We can confine ourselves to examining this data for IBM and plug-compatible processors and peripherals, since these products generate the largest volume of UCC1 activity. If IBM is not shipping "new" or is in "limited production," the UCC1 filing data can represent the used equipment market. However, if the product is at the beginning of its life cycle, the data represents, for the most part, shipments from IBM.

One has to be cautious in this assessment, since IBM 3090 Model 200s are now in limited trading in the used market. It is also important to remember that original equipment vendors establish the selling price of new equipment, but supply and demand dictate the price that dealers and lessors can charge for older equipment.

Looking at the percentage of units and dollars spent for each product group last year, compared with the first eight months of 1987, brings to light two characteristics that merit discussion. Changes in the unit percentages by product group were modest in that time period. In fact, the percentages for the 3090 and 3080 product groups stayed the same, reflecting the relative lack of demand for units.

Percentages of dollar volume, on the other hand, were much more volatile. The 3090 accounted for 48% of the total dollars this year, compared with 39% last year, while the 3080 group lost an equivalent share.

Change in market

This disparity came about primarily because the market value of 3080 systems decreased substantially during the last year, due to low supply and demand. Causal factors included sluggish expansion in the site base and users' hunger for greater capacity.

Thus, at mid-year 1986, a 3081 processor was worth approximately $1.5 million vs. $900,000 at mid-year 1987. Similarly, a 3084 processor dropped from $3.5 million to $2 million.

The IBM 4300 series presents an interesting situation. The percentage of total units dropped from 8% to 6%, but the percentage of dollar value increased from 8% to 9%.

The 4300 and the 3080, two series of approximately the same vintage, are valued very differently in the market.

Two factors help explain this apparent contradiction. First, larger and more expensive models are better represented this year. For example, 4381s represent 70% of the lease and finance activity in the 4300 class in the first part of 1987; the remaining 30% is made up by the 4331, 4341 and 4361. Last year the two groups were evenly represented.

A second influence is IBM's recent announcement of the availability of enhanced models for the 4381 group, which boosted the value of all equipment in that class. At the same time, older, less powerful models in the series lost virtually all of their market value. The 4241s are now worth less than $20,000 and 4331s less than $5,000. This drop in value had little impact on the value of the series as a whole, however, because fewer of these systems were being traded.

Shift from single to double

The only change of any significance in the 3380-type direct-access storage device has been in the shift from single- to double-density drives. There is still an active market remaining for the single-density 3380s, but the number of units traded and the average market value are both decreasing.

The typical price last year for 3380s was more than $60,000 and has now fallen to less than $40,000. The prices of double-density drives have held relatively steady at around $100,000, but the newly announced triple-density drives will negatively affect their price as soon as volume shipments occur.

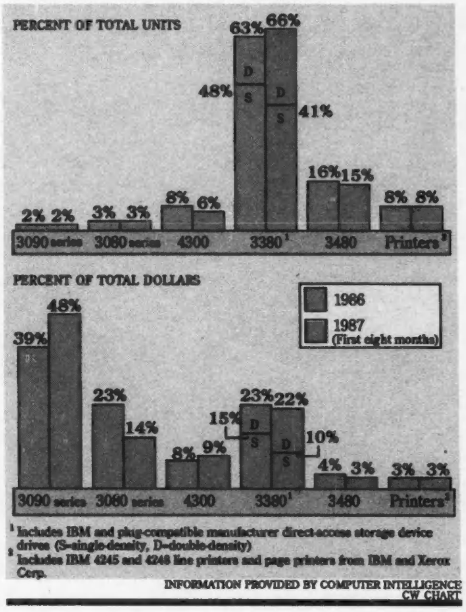
These shipments may be hindered by market reactions to the unavailability of the 3990 controller, which is not scheduled to be available until the third quarter of 1988.

In many ways, the mechanics of the leasing industry make it recession-proof. During tough economic times, the volume of used equipment trading increases, and the buy-and-sell side of the leasing business thrives. In boom times, with increased shipments of new equipment, more leases are written for new equipment.

While not perfect, this balance allows the industry to thrive and succeed. Projections indicate that through the end of the third quarter of this year, leasing industry activity in the IBM mainframe and peripheral market will be up 17% to 18% from 1986, and analysts expect 1987 could end with an overall increase in leasing industry volume as high as 20%. ■

Leasing activity and value for selected IBM and compatible products

Unit, dollar volumes based on UCC1 filings



[1] Includes IBM and plug-compatible manufacturer direct-access storage device drives (S=single-density, D=double-density)

[2] Includes IBM 4245 and 4248 line printers and page printers from IBM and Xerox Corp.

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Papciak is senior vice-president with Computer Intelligence Corp., a computer and communications market analysis firm in La Jolla, Calif.

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LOOK IN THE BUY, SELL SWAP SECTION

A walk on the lessor side hones bargaining skills

BY JANN-MARIE HALVORSEN

Lessees, wary of turmoil and concerned with cost, are favoring the stability of large, internally funded lessors and are capitalizing on the lessee's market to solicit the lowest bid.

However, the largest lessor is not always the optimal financing source. Nor does the lowest rate necessarily represent the least costly transaction.

The consolidation currently under way in the computer leasing industry is forcing many small and medium-size independent leasing companies to seek new equity sources or other niche opportunities to survive.

A niche player with remarketing expertise for a particular type of equipment or a small independent with strong ties to an equity source that is aggressive in rates or flexible in terms — either of these could prove a more advantageous alternative.

Motivation

To thoroughly screen all bids and astutely negotiate terms, a lessee must understand lessors' motivations and constraints, which might suggest a relationship, rather than a transaction, approach to leasing.

Below-market proposals, fostered by a competitive climate, concern the MIS director faced again with the possibility of explaining to senior management a lessor's last-minute withdrawal of an accepted bid because of lack of an equity source.

Short of dealing solely with self-funding lessors, which would limit alternatives, what can an MIS director do to confirm the legitimacy of a bid?

Informal dress

It is not realistic to require written confirmation of all the equity sources behind bid proposals. Time constraints and the odds against successful bidding often discourage lessors from formalized preselling procedures.

An experienced equity syndicator knows the market and equity sources well enough to base a bid on an informal, verbal equity quote. What is realistic and reasonable, however, is awarding a contract contingent on the identification of, and firm commitment by, the equity source within approximately 10 business days.

Financial statements on both the bidder and equity source may be required as well. Privately held companies should be willing at least to furnish sufficient financial information, including bank references, to assure the lessee of their stability.

A number of factors need to be considered before specifying the desired length of a lease. The most aggressive bid may be term driven, a reflection of the lessor demand for a specific term to satisfy the investment parameters of a particular equity investor.

The lessee who specifies a single required term in a bid request without lessor input foregoes such opportunities.

Lessor residual assumptions also dictate pricing. The proposed lease term that extends just beyond an anticipated new product announcement suffers the consequences of the sudden drop in the residual valuation curve. In choosing the optimal lease term, the lessee should, to the extent possible, temper capacity planning issues with residual valuation analysis.

A three-year term with an option to renew at fair-market rental is preferable to a five-year lease if capacity needs suggest a box swap in year four and if the residual value of the original box is predicted to drop dramatically in year three.

> CHURNING equipment before lease termination is central to the lessor's profitability and a key element in negotiating lease terms and conditions.

Even if subleasing is allowed in the five-year lease, the lessee makes up the difference in any shortfall between the original monthly lease rate and the sublease rate, which will reflect the third-year drop in market value.

Churning equipment before lease termination is central to the lessor's profitability and a key element in negotiating lease terms and conditions.

Margin issues

As lease financing profit margins narrow, the lessor increasingly turns to asset management and remarketing for its required return on investment. Upgrade pricing and sublease rights can also become sensitive points of the negotiation process.

In its original bid, the lessor factors in anticipated upgrades. Profitability potential is assessed based on forecasting upgrade pricing cuts, the concurrent decrease in equity dollars required in the upgrade and the enhanced residual value of the upgraded machine. Anticipate, therefore, that the lessor will be reluctant to allow upgrade financing through other third parties.

At the very least, a lessor will try to negotiate first refusal or the right to match another party's upgrade bid. If third-party upgrade financing is allowed, the original lender and the equity source will both insist that the lessee agree to split the machine back to its original components or downgrade at lease termination to clarify their original ownership and secured interest positions.

In evaluating any third-party upgrade proposals, the lessee must, therefore, factor in the downgrade cost, which can be substantial.

In the current competitive environment, lessees are successfully negotiating the additional flexibility of subleasing, which places control of the asset in their hands and increases the probability of the equipment going to full term.

This is not an option a lessor is likely to advance, since subleasing limits the lessor's opportunity to pull the equipment out on a box swap and remarket it early enough on the residual curve to optimize the return. For that reason, most lessors prefer to remain silent on subleasing and negotiate, as appropriate, at the time of the takeout.

Since lessees remain obligated during the sublease for the timeliness and original amount of monthly rentals due, they can clearly assume some of the residual risks of their own — the shortfall between the original rents and between the sublease rents.

A working relationship with a lessor strong in remarketing and cooperative about finding sublessees mitigates this risk.

Establishing relationships and maintaining dialogue with lessors can facilitate the leasing process from beginning to end.

The MIS director or procurement manager who expends time and effort in the bidding and review process, carefully wading through proposals and reviewing each package with the respective lessor will optimize the company's position and will also minimize the danger of unpleasant financial surprises at expiration time. •

Halvorsen is vice-president and service director of financial strategies for the Gartner Group, Inc., a Stamford, Conn., strategic analysis and consulting firm.

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Used equipment: PBXs enter market

BY ELLEN KITZIS

During the early 1970s, discussing the number of mainframes traded on the used equipment market would have been small talk. And if anyone had thought to bring up the private branch exchange (PBX) market at all, the conversation would have been a real yawn.

During the past 15 years, however, the used processor market, fueled by shortening product life cycles and dramatic increases in shipments, has become big business. Today, more than 300 dealers and lessors currently registered with the Computer Dealers and Lessors Association (CDLA) participate in the buying, selling and leasing of mainframes, peripherals, mid-range systems and, most recently, personal computers.

At the same time, business in used PBXs has picked up considerably, with more than 100 dealers and brokers participating. Market emphasis is on systems of less than 800 lines sold to companies ranging from the Fortune 1,000 to small and medium-size firms.

PBX shipments to new sites were still in their heyday through the early 1980s, and PBX technology was just beginning to standardize around a common set of features and system capabilities. At this time, the parts-only trade, beginning with a few dealers and brokers, was the first signal of an emerging market for used equipment.

Now, a few years later, the maturing PBX market has slowed down. The number of PBX lines shipped to new sites declined in 1986 and is expected to grow at a plodding compound annual-growth rate (CAGR) of 2.1% through 1992.

The replacement market, including add-ons to existing systems, shows a more favorable growth rate, however, and telecommunications analysts at International Data Corp., a Framingham, Mass.-based market research firm, expect the replacement market to grow at a 6.6% CAGR between 1986 and 1992.

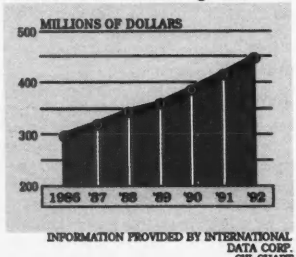
Three critical factors

Moving equipment out of the primary market into the secondary market and back out to user sites requires that dealers and brokers be able to perform three critical functions: sourcing, trading and placing.

- Sourcing is the identification of complete installed systems that are about to be replaced by new PBX equipment.
- Placing is the process of identifying end users who want used systems configured to their organization's needs.

The used private branch exchange market

Estimated dollar value through 1992



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CW CHART

- Trading is the dealer-to-dealer exchange activity required to identify all the parts necessary to meet end users' configuration requirements.

All brokers and dealers attempt to maximize the amount of equipment they can source. Since the market is still maturing, end users are just beginning to recognize the value of their used equipment. Thus, brokers are still able to buy systems inexpensively from end users, with as much as a 20% spread between wholesale and retail prices for used PBXs. Among themselves, however, brokers and dealers are beginning to differentiate between the amount of equipment they place and the amount they trade.

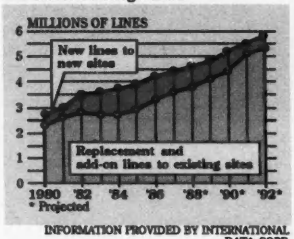
Small brokers focus on placing reconfigured systems in customer sites, while larger brokers inventory and trade larger volumes of equipment, thereby becoming clearinghouses for smaller dealers.

Up until now, the used PBX market has been dominated mostly by a few large brokers, clearinghouses and a multitude of local, regional and national firms. Several forces are at play, however, that suggest the feast these players enjoy now will soon be shared with hungry new entrants — the leasing firms.

Major lessors first entered the telecommunications market several years ago, predominantly offering new leases for telecommunications equipment. A recent IDC survey of CDLA members indicates that more than 40% of the respondents derive some percentage of their revenue from either buying, selling or leasing telecommunications equipment.

Trends in shipments of private branch exchange lines

Lines for new sites and replacements and add-ons through 1992



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

The majority of the equipment has not yet come off lease. But as this day looms closer, more lessors, by necessity, will become participants in the used equipment market.

Interconnects — installers and maintainers of PBX equipment and long-time players in the telecommunications market — represent another tier of participants. Their ability to install and service new customers' equipment as well as their existing customer base makes interconnects potentially strong competitors in the regional and local markets.

Regional Bell holding companies and large credit corporations are another group of players that will be looking for their slice of the pie.

About 40% to 60% of the lease portfolios of the holding companies is in telecommunications equipment. While very little of this equipment is not leased, the majority of the holding companies expect to write more operating leases in the future and push used equipment through the brokerage community.

How fast will it grow?

Estimates of the PBX secondary market need to be examined closely. Some market observers report on the transaction volume within the market, including dealer-to-dealer trading, while others include new PBX equipment leases.

IDC estimates that this market reached almost $300 million in 1986 and will grow to almost $450 million by 1992.

On a comparative basis, this means the used equipment market equals about 10% of the dollar value of lines shipped in 1986 and roughly 3% to 4% of the "aged" installed base value of all PBX equipment. •

Kitzis is managing consultant with the Leasing Planning Service at International Data Corp. in Framingham, Mass.

To Lease
Or
Not To Lease
Is Not
The Question...

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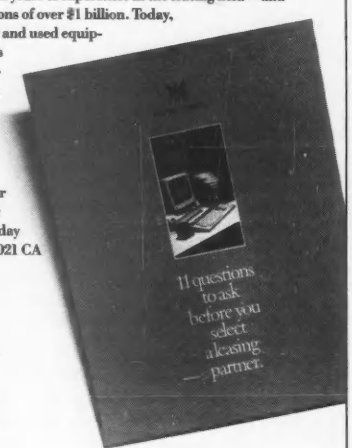

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Third-party equipment lessors

COMPANY	TOTAL STAFF SIZE	COMPUTER HARDWARE BRANDS	TYPES OF COMMUNICATIONS EQUIPMENT	TYPES OF SPECIALIZED EQUIPMENT	LENGTH OF LEASE CONTRACTS OFFERED (IN MONTHS)	TYPES OF LEASING AGREEMENTS	SOFTWARE LEASING	ENGAGE IN BROKERAGE	TYPES OF EQUIPMENT BROKERED	IN-HOUSE MAINTENANCE SERVICE	OTHER PROVISIONS FOR MAINTENANCE	HANDLING OF MAINTENANCE CHARGES	DISASTER RECOVERY SERVICE	OTHER CONSULTING OR VALUE-ADDED SERVICES
AIC Leasing Services, Inc. (203) 866-0840	1-13	IBM, DEC, Amdahl, others	All IBM	None	1-60	Finance, operating	No	No	NA	No	No	NA	No	None
Alpha Financial Group, Inc. (616) 458-3235	—	IBM	Telecommunications, modems, multiplexers	CAD/CAM[1]	24-36	Finance, operating	Optional	No	NA	No	No	NA	No	Data center planning
American Communication Leasing Co. (a division of American Computer Group, Inc.) (617) 437-1100	50-100	Any communications equipment vendor	All	None	12-60	Operating	Only with hardware	No	NA	Yes	NA	Client-determined	No	None
American Computer Exchange, Inc. (203) 431-0276	9	IBM	IBM 3724, 3725 controllers	None	12-16	Operating	Yes	Yes	IBM	No	No	NA	No	None
Argonaut Computer Sales, Inc. (714) 661-8644	30	IBM	Modems, terminals, front-end processors	None	24-48	All	No	Yes	IBM	Yes	Third-party agreement	—	No	Systems engineering consulting
Barrett Capital & Leasing Corp. (914) 381-4600	5	IBM, DEC, Tandem, Honeywell Bull, Wang, others	PBXs[2], controllers	CAD/CAM, point-of-sale, medical	24-60	Finance, operating, tax leverage	Yes	Lease manager services	IBM, DEC, Tandem, Honeywell Bull, Wang, others	No	No	NA	No	Hardware recommendations, facilities planning, asset management services
BATA Resources, Inc. (201) 285-0905	25	IBM	Modems, 3705/3725 controllers, 3274 control unit	Point-of-sale	12-36	Finance, operating	Only with hardware	Yes	IBM	No	In-house warranty	Separate contract	No	PC networking consulting service
Bell Atlantic Capital Corp. (201) 368-2318	900	Most major brands	All	CAD/CAM, point-of-sale	12-60	Rental, operating, true, asset-based financing, other financial	Yes	No	NA	Yes	Third-party agreement	Client-determined	No	Installation, equipment management and remarketing, new and used equipment, reconfiguration, testing, selection, evaluation
Berlant Industries, Inc. (516) 333-0505	10	IBM	None	None	1-48	Finance, operating	Yes	Lessor of software	IBM communications equipment, disk and tape drives, terminals, printers	No	Third-party agreement	Separate contract	No	Hardware selection services
Bluebonnet Computer Co. (512) 926-3900	10	IBM	AT&T PBXs, Paradyne modems	None	1-60	Operating	Yes	No	NA	Optional	IBM	Client-determined	Yes	None
Camelback Computer Investors (602) 998-2880	50	IBM, DEC, NCR, Unisys	None	Banking (document processing)	—	Operating	No	Yes	IBM, DEC, NCR, Unisys	No	No	NA	No	None
CAP Industries, Inc. (305) 458-4700	103	IBM, C. Itoh, Beehive, Datasouth, NCR, Memorex, others	Modems	ATM	24-36+	Bank, direct	No	Yes	IBM, C. Itoh, Beehive, Datasouth, NCR, Memorex, others	Yes	Repair in-house, off-site	Time materials or contract	No	IBM VAR[3]
Capital Associates, Inc. (213) 318-9000	—	IBM, DEC, NAS, Wang, Storage Technology, Amdahl, others	All	All	6-120	All, primarily operating, leverage	No	Yes	CPUs, DASD[4], tape, communications, printers	No	No	NA	No	None
Capital Marketing Group Corp. (516) 599-3433	4	IBM, Xerox	None	Banking	3-60	Operating, capital	No	Yes	IBM	No	No	NA	Optional	Long-range hardware and facility planning, financial analysis, hardware budgeting
Capricorn Capital Group, Inc. (313) 855-4666	15	IBM, Telex processors	None	None	36-48	Operating	No	Yes	IBM, Telex processors	No	No	NA	No	None
Champion Computer Corp. (305) 785-4100	20	IBM System/34, 36, 38	Modems, controllers, multiplexers	None	6-60	Operating, capital	Yes	Yes	IBM System/34, 36, 38, compatibles	Locally	Third-party agreement	Separate contract or per call	No	None
CIS Corp. (215) 437-1900	950	IBM, plug compatibles, DEC, Amdahl, Unisys, others	PBXs, telecommunications	ATM, CAD/CAM, point-of-sale, banking	6-60	All	Yes	Yes	Processors, peripherals, communications	No	Third-party agreement	Included in lease or separate contract	No	Consulting services for DP installation, equipment planning, software conversion
Coastal Computer Consultants Corp. (617) 526-4301	5	IBM, Memorex	All	None	36	—	No	Yes	IBM, Memorex	No	Third-party agreement	NA	No	None
Conbro/Lexacom (416) 383-6011	4	IBM, Tandem	None	None	12-60	Operating, finance, tax-exempt	Only with hardware	Yes	IBM, Tandem	No	Vendor-supported	NA	No	None

[1]Computer-aided design/manufacturing
[2]Private branch exchange
[3]Value-added reseller
[4]Direct-access storage device
[5]Very small aperture terminal

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

COMPANY	TOTAL STAFF SIZE	COMPUTER HARDWARE BRANDS	TYPES OF COMMUNICATIONS EQUIPMENT	TYPES OF SPECIALIZED EQUIPMENT	LENGTH OF LEASE CONTRACTS OFFERED (IN MONTHS)	TYPES OF LEASING AGREEMENTS	SOFTWARE LEASING	ENGAGE IN BROKERAGE	TYPES OF EQUIPMENT BROKERED	IN-HOUSE MAINTENANCE SERVICE	OTHER PROVISIONS FOR MAINTENANCE	HANDLING OF MAINTENANCE CHARGES	DISASTER RECOVERY SERVICE	OTHER CONSULTING OR VALUE-ADDED SERVICES
Candlaco, Inc. (312) 698-3000	1,100	IBM, DEC, Amdahl, Wang, NAS, Prime, DG	PBXs, VSATs[2], satellites, modems	ATM, point-of-sale, CAD/CAM, technical	12-84	Operating	Yes	Yes	All computer, communications	No	National agreement to provide Sorbus maintenance	Included in lease or billed directly	Yes	In-house, regional technical update seminars on computer and communications industry
Compu-Act Co. (813) 863-2461	18	IBM	Modems	None	3-36	Full payout	Optional	Yes	IBM System/34, 36, 38, PCs, Decision Data printers	Yes	NA	Separate contract	Through maintenance contract	None
Commonwealth Computer Advisors, Inc. (804) 282-5500	7	IBM, Intergraph	PBXs	Bank check processing	1-48	Operating, finance	No	Yes	IBM, Intergraph	No	No	NA	No	None
Computer Equity Corp. (212) 969-9600	—	IBM, DEC, HP, DG, Apollo, Calma, Applicon	AT&T, Rolm	CAD/CAM	1-60	All	Yes	Yes	Processors, peripherals	No	No	NA	No	Assignment management
Computer Financial, Inc. (201) 489-2600	10	IBM, Amdahl, NAS, others	PBXs	None	12-60	Operating, tax leverage	No	Yes	Processors, peripherals	No	No	NA	No	Programs, seminars, publications, residual forecasting
Computer Marketing, Inc. (609) 823-6000	3	IBM processors, peripherals	Front-end controllers and terminals, modems, multiplexers	ATM, point-of-sale, bank document processing	3-60	Operating	No	Optional	IBM processors, peripherals	No	Third-party agreement	NA	No	Consulting, appraisal services
Computer Merchants, Inc. (914) 238-9631	18	IBM processors, peripherals	Controllers	None	24-48	Finance, operating, trade-ins	No	Yes	IBM processors, peripherals	No	Vendor-supplied, third-party agreement	NA	No	Appraisals, publication of price and marketing information
The Computer Place (216) 351-7444	30	Unisys, Honeywell Bull, IBM	LANs, emulation boards for connecting IBM PCs to Unisys, Honeywell mainframes	None	12-72	All	Optional	Yes	Unisys, Honeywell Bull, IBM mainframes	Yes	Third-party agreement when necessary	Separate contract	Honeywell only	Residual forecasting and guarantees, technical consulting
Computer Resale Exchange, Inc. (202) 737-1401	8	IBM (all equipment); Unisys, HP mainframes; Xerox laser printers; IBM 3890, 4700 banking terminals	AT&T PBXs, Northern Telecom, Rolm, Micom	IBM 3890, 4700 banking terminals	1-60	All	No	No	NA	No	Third-party agreement, recommendations	NA	No	Appraisals
Computer Sales International, Inc. (314) 997-7010	115	IBM, DEC, Wang, Telex, Storage Technology, Amdahl, NAS, Prime, Compaq, Epson, Okidata, HP	Modems	CAD/CAM	1-60	Operating, finance	Yes	Yes	CPUs	PC maintenance	No	Separate maintenance contract for PCs	No	None
Computer Systems/ Graphics, Inc. (913) 491-3663	5	IBM, Storage Technology, CDC, Telex, Memorex, NAS	Modems, multiplexers	None	1-60	All	No	Optional	—	No	Optional third-party agreement	NA	No	None
Computer Systems Marketing, Inc. (913) 492-3131	6	IBM, DEC processors, peripherals	Modems, multiplexers	None	1-60	Operating, some finance	No	Optional	IBM, DEC processors, peripherals	No	Third-party agreement when necessary	NA	No	None
Concord Systems, Inc. (312) 823-5650	8	IBM	Modems, multiplexers	None	36 or less	Operating, finance	No	Yes	IBM processors, peripherals	No	Third-party agreement	NA	No	None
CSA Financial Corp. (617) 482-4671	65	All	All	CAD/CAM, ATM	12-120	Operating, finance	Yes	No	NA	No	Third-party agreement	Included in lease or at lessee's obligation	No	Lease consulting, equipment disposition
Dana Marketing, Inc. (213) 212-3111	60-70	IBM, Decision Data, Telex, Anasc, Memorex, Printronix, GBT	Modems	Point-of-sale	12-60	Operating	No	—	—	No	Recommendations	NA	—	Upgrade consulting, customized leasing
Data Exchange, Inc. (312) 963-4424	30	IBM System/34, 36, 38, 4300 with peripherals, some Memorex peripherals	Modems, controllers, others	None	12-60	All	Optional	Yes	Processors, peripherals	Yes	Third-party agreement	Separate contract, time materials	Yes	None
Datalease Capital Corp. (203) 223-0170	20	IBM 4300, System/34, 36, 38, all DEC, all Wang	Modems, controllers	Check sorter, ATM, document processing	12-60	Operating, true, equity	Yes	Yes	Processors, peripherals	No	No	NA	No	None
Data Sales Co. (612) 890-8838	60	IBM processors, peripherals	Modems, controllers	None	1-60	Operating, finance	No	Yes	Processors, peripherals	No	No	NA	No	None
Dataserv, Inc. (612) 829-6385	175	IBM, DEC, Xerox, Amdahl, NAS	All	ATM, banking (including check sorter), CAD/CAM, point-of-sale	12-60	Operating, finance	Yes	Yes	Point-of-sale, banking, all types of IBM equipment, processors, peripherals	Yes	On-site, depot	Negotiation of customized maintenance contracts; included in lease or separate	No	Point-of-sale and banking equipment consulting, IBM 4680 (hardware and software), maintenance consulting
Data Three Computer Corp. (800) 328-0004	100	IBM, DEC, Wang, AT&T	AT&T phone and data systems	Point-of-sale	3-60	—	Only with hardware	Yes	CPUs, PCs, modems, multiplexers, PBXs	No	Third-party agreement, technical support	NA	No	Technical support, reconfiguration, installation
Decimus Corp. (a subsidiary of General Electric Credit Corp.) (415) 434-3060	60	IBM, DEC, Amdahl, Honeywell Bull, HP	PBXs, controllers, modems	CAD/CAM, point-of-sale	1-60	Finance, operating, leverage, loans	Yes	Yes	Mainframes, peripherals, communications equipment, CAD/CAM, point-of-sale	No	No	Separate contract	No	Financing on full range of capital, commercial equipment

COMPANY	TOTAL STAFF SIZE	COMPUTER HARDWARE BRANDS	TYPES OF COMMUNICATIONS EQUIPMENT	TYPES OF SPECIALIZED EQUIPMENT	LENGTH OF LEASE CONTRACTS OFFERED (IN MONTHS)	TYPES OF LEASING AGREEMENTS	SOFTWARE LEASING	ENGAGE IN BROKERAGE	TYPES OF EQUIPMENT BROKERED	IN-HOUSE MAINTENANCE SERVICE	OTHER PROVISIONS FOR MAINTENANCE	HANDLING OF MAINTENANCE CHARGES	DISASTER RECOVERY SERVICE	OTHER CONSULTING OR VALUE-ADDED SERVICES
Diverse Computer Marketers, Inc. (313) 855-5960	10	IBM processors, peripherals	Modems, multiplexers, controllers	ATM, CAD/CAM, banking	1-60	Operating, finance	Yes	Yes	IBM processors, peripherals	No	Recommendations	NA	No	Troubleshooting banking configurations
DPC Equipment & Leasing Ltd. (613) 692-2563	4	IBM, DEC	PBXs	None	12-60	Operating	No	Yes	All IBM hardware	No	Third-party agreement	Separate or inclusive if third-party	—	None
Economic Data Corp. (303) 399-4666	3	IBM	Controllers	None	24-36	Operating	No	Optional	Processors, peripherals	No	No	NA	No	None
El Camino Resources Ltd. (818) 968-2411	96	IBM, DEC	Telephone switches, modems, multiplexers	ATM, CAD/CAM, 3890 check processors	1-60	Finance, operating, short-form	Only with hardware	Yes	Processors, peripherals, communications	DEC equipment only	No	Client-determined	Yes	None
Empire Computer Group, Inc. (914) 997-0930	5	IBM	Modems	No	—	Operating, finance	No	Optional	Processors, peripherals	No	Third-party agreement	NA	Broker disaster recovery services	Site planning, serviceware
Equitable Life Leasing Corp. (619) 458-4400	360	IBM, DEC, NAS, Unisys, Prime, DG, HP	All	CAD/CAM, CAE	12-60	Finance, operating, manufacturer's captive	Limited	Yes	Processors, peripherals, communications	No	Third-party, manufacturer's agreement	Included in lease or separate contract	No	None
Fidelity Leasing Associates (800) 223-3543	34	IBM, Telex, Xerox	Modems, multiplexers, front-end processors	None	12-48	Operating	No	No	NA	No	No	NA	No	Equipment swapping, takeouts, upgrades
First Computer Corp. (713) 666-3033	9	IBM, Honeywell Bull, DEC, AT&T, Rolm, Mitel, others	All (PBXs, modems, multiplexers, etc.)	All	12-120	All	Yes	Yes	High-tech	Yes	Varies	Varies	No	—
Forsythe McArthur Associates, Inc. (312) 675-8000	75	IBM, all others	All	All	36-48	All	Yes	Yes	All	No	No	NA	No	Capacity planning
Frontier Computer Corp. (214) 330-7243	20	IBM, AT&T	AT&T PBXs, IBM modems, multiplexers, 3725 controllers	None	48	All	Yes	Yes	NA	Yes	Third-party agreement	Separate contract	No	None
Goldenwest Computer Marketing, Inc. (714) 645-1555	Less than 5	IBM	None	None	1-60	Operating, finance	No	No	NA	Optional	No	NA	No	None
Grammco Computer Sales, Inc. (512) 696-4030	95	IBM, DEC, NCR, Gould, HP, Hydra, Dataproducts, others	Multiplexers, modems	Synercom, Intergraph, IBM CAD/CAM	1-60	Operating, finance	Yes	Yes	Processors, peripherals	Yes	No	Client-determined	Yes	Disaster recovery; VAR services for banking, mortgages, hospital and grocery industries; site planning and consulting
GTEX Financial Group, Inc. (214) 783-1212	10	IBM, DG, Unisys, Amdahl, NAS, Memorex, Storage Technology	Modems	Financial for banks, CAD/CAM, ATM	6-36+	Operating, finance	No	Yes	Processors, peripherals	No	Optional third-party agreement	NA	No	Site planning, consulting
Honeywell Information Systems, Inc. (612) 870-5200	9	IBM, DEC, DG, HP, Prime	All	CAD/CAM	—	Operating	Yes	Yes	Processors, peripherals	No	No	NA	No	Reviewing configuration, hardware planning, temporary disaster recovery assistance
IBL Corp. (203) 353-1100	20	IBM, Amdahl	IBM 3725 controllers	ATM, point-of-sale, CAD/CAM, all technical	12-84	Operating	Only with hardware	Yes	Processors, peripherals	No	Third-party agreement	NA	No	International perspective and services
IFA, Inc. (312) 991-6262	30	IBM, DEC, Amdahl, Wang, others	Modems, multiplexers, controllers	CAD/CAM	36-48	Operating, finance	No	No	NA	No	Through manufacturer	NA	Yes	None
IMF Group, Inc. (617) 631-3955	12	IBM, DEC, Amdahl	None	ATM, CAD/CAM, point-of-sale, manufacturing	24-180	Operating, finance, tax leverage, money-over-money	Yes	Yes	All	No	No	Separate contract	No	Management of other lessors, IBM portfolios
Information Processing Systems, Inc. (201) 489-0707	20	IBM	None	CAD/CAM	24-60	Operating, finance, tax leverage	No	Yes	CPUs, tapes, disks, printers	No	No	NA	No	None
IOA Data Corp. (212) 673-9300	10	IBM, NCR, Unisys	None	Microfilm	12-48	Operating, finance	No	No	NA	No	Third-party agreement	NA	No	None
JMS Computer Associates (404) 475-1000	21	IBM	Modems, multiplexers, controllers, PBXs	ATM, point-of-sale	12-36	Operating	Only on finance basis	Yes	Processors, peripherals	Yes	No	Included in lease	No	None
KCI, Inc. (201) 934-6500	7	IBM, T Bar, Dataswitch, Storage Technology	IBM, channel switch	None	1-60	Operating, finance	No	Yes	Processors, peripherals, communications	No	Through manufacturer	Separate maintenance contract	No	Installation, reconfiguration services
LaSalle Computer Corp. (312) 987-1750	9	IBM, DEC, NCR, Prime, Fujitsu, AT&T, others	All	Point-of-sale	12-60	Operating, finance	Yes	Yes	Processors, peripherals, communications	No	No	NA	No	None
Lease Funding Corp. (203) 431-8445	10	IBM, DEC, Wang, DG, Unisys	All	All	24-60	Operating	No	Yes	Processors, peripherals, communications	No	—	—	No	—
Leasing Associates Corp. (203) 637-8500	—	Telex, IBM	None	None	1-60	All	Optional	Yes	3270 communications	No	Third-party agreement	Transfer of third-party agreement	No	None
Leasetech Ltd. (416) 222-3100	10	IBM, DEC, Amdahl, others	Northern Telecom products	None	12-60	Operating, finance	Yes	Yes	Processors, peripherals, communications	No	No	NA	No	Installation, deinstallation

COMPANY	TOTAL STAFF SIZE	COMPUTER HARDWARE BRANDS	TYPES OF COMMUNICATIONS EQUIPMENT	TYPES OF SPECIALIZED EQUIPMENT	LENGTH OF LEASE CONTRACTS OFFERED (IN MONTHS)	TYPES OF LEASING AGREEMENTS	SOFTWARE LEASING	ENGAGE IN BROKERAGE	TYPES OF EQUIPMENT BROKERED	IN-HOUSE MAINTENANCE SERVICE	OTHER PROVISIONS FOR MAINTENANCE	HANDLING OF MAINTENANCE CHARGES	DISASTER RECOVERY SERVICE	OTHER CONSULTING OR VALUE-ADDED SERVICES
Marshall Lewis (a division of Neptune Computer Group (714) 641-0366	120	IBM, DEC, Unisys, Prime, AT&T, Sun	Modems, multiplexers, PBXs, controllers	None	1-60	Operating, finance	Only with hardware	Yes	Processors, peripherals	No	Third-party agreement	Included in lease, seperate maintenance contract	No	Financial and system consulting, VAR, performance consulting
Matrix Computer Funding Corp. (801) 566-9201	30	All	Modems, multiplexers, switches	ATM, CAD/CAM	12-60	Finance, operating, tax leverage, manufacturer's captive	Only with hardware	No	NA	No	No	NA	No	None
McDonnell Douglas Finance Corp. (800) 622-6707	284	IBM, DEC, HP, Tandem, Microdata, others	PBXs, others	ATM, CAD/CAM, point-of-sale, environmental controls	36-84	Operating, finance; vendor programs; private, public income investments	Yes	Yes	All	No	No	Separate contract	No	—
The Meridian Group (312) 940-1200	85	IBM, DEC, HP, Honeywell Bull, Wang, Unisys, Xerox, Kodak	PBXs (AT&T, Rolm, United Technologies, Northern Telecom, NEC, Stromberg-Carlson)	Image-processing systems, CAD/CAM	12-84	Finance, operating, tax leverage	Yes	No	NA	No	No	NA	No	Technical consulting, debt and equity placement, system installation and deinstallation, product remarketing
Miller Information Processing Services Corp. (315) 422-0484	8	IBM	3705, 3725 controller	None	12-60	Operating	No	Yes	Processors, peripherals	No	Third-party or manufacturer agreement	Separate contract	No	Hardware consulting, installation, deinstallation
Mountain Capital Corp. (404) 939-7200	20	IBM	All IBM	None	12-36	Operating, finance	Limited	Yes	—	No	Manufacturer lease requires IBM maintenance	Separate contract	No	None
Neidan Associates, Inc. (718) 706-6000	2	IBM	Any	None	—	Operating	No	Yes	—	No	Manufacturer agreement	NA	No	None
Nelco, Ltd. (804) 794-3009	10	IBM, DEC, HP, Compaq	Modems, multiplexers, phone systems	CAD/CAM	1-60	Operating, finance	Only with hardware	Yes	Processors, peripherals, communications	No	Third-party agreement	Separate contract	No	Budget assistance, hardware evaluation
Neu-Comp Co. (312) 705-9444	8	IBM	None	3270 series communications	1-72	Operating, finance	No	No	NA	No	Third-party or manufacturer agreement	Separate contract	No	None
Newman Computer Exchange, Inc. (313) 994-3200	120	DEC, Wang	DEC, Wang	None	—	Operating, finance	Yes	Yes	—	No	No	NA	No	None
Newport Leasing, Inc. (714) 770-2122	15	IBM	All IBM	Mainline IBM products	1-60	Operating, sales	Yes	No	NA	Yes	Third-party agreement	Separate contract	No	Hardware consulting; installation, deinstallation consultation
New York Systems Exchange, Inc. (516) 673-3830	11	IBM, DEC, HP	All IBM	None	1-60	Operating, finance	No	Yes	Processors, peripherals, communications	No	No	NA	No	Facilities planning
NFC Leasing, Inc. (312) 789-8000	100+	IBM, Wang, AT&T, Datapoint, others	PBXs	None	1-60	Operating, finance, leased-line	No	Yes	Processors, peripherals, communications	No	No	NA	No	None
Oliver-Allen Corp. (415) 332-6262	35	IBM, DG, Unisys, DEC, others	All	All banking, ATM, CAD/CAM, point-of-sale	24-60	Finance, operating, tax leverage, vendor	Only with hardware	Yes	ATMs, point-of sale, IBM Series/1 and 8100, all banking equipment	No	Yes	Included in lease or separate contract	No	IBM VAR
Palman Enterprises, Inc. (201) 265-8921	12	IBM, AT&T, Amdahl, Wang	All	ATM, CAD/CAM	1-60	Operating, finance	Yes	Yes	Processors, peripherals	No	Third-party or manufacturer agreement	Separate contract	No	Software consulting
Phoenix Computer Group, Inc. (800) 831-4041	22	IBM, Memorex, Decision Data, Datacom, NEC	Phone systems, switches	None	1-72	Operating, finance	No	Yes	Processors, peripherals, communications	Yes	Manufacturer agreement	Separate contract	Yes	None
Phoenix Leasing, Inc. (a subsidiary of Phoenix America, Inc.) (415) 485-4500	259	IBM, DEC, NAS, Amdahl, Wang, others	Modems, voice message-exchange units	CAD/CAM, point-of-sale, CAD/CAM	12-60	Operating, finance, leverage, vendor programs	Yes	No	NA	No	Third-party or manufacturer agreement	Client-determined	No	Equipment remarketing
Premier Computer Sales, Inc. (818) 716-9944	—	IBM	3725 controllers	None	—	Client-determined	Yes	Yes	Processors, peripherals	No	Recommendations	NA	No	Financial planning
Princeton Computer Group, Inc. (609) 655-5700	34	IBM, DEC, DG, Wang, Xerox, Memorex, EMS Memory Products	PBXs, modems, front ends	ATM, CAD/CAM, point-of-sale	1-60	—	Yes	Yes	Processors, peripherals, communications	Yes	Third-party agreement	Included in lease or separate contract	No	PC sales and maintenance
OCM Corp. (800) 445-7613	10	IBM	Controllers	None	12-60	Finance, operating	Yes	Yes	Processors, peripherals	Yes	Manufacturer agreement	Included in lease	Yes	Hardware consulting

COMPANY	TOTAL STAFF SIZE	COMPUTER HARDWARE BRANDS	TYPES OF COMMUNICATIONS EQUIPMENT	TYPES OF SPECIALIZED EQUIPMENT	LENGTH OF LEASE CONTRACTS OFFERED (IN MONTHS)	TYPES OF LEASING AGREEMENTS	SOFTWARE LEASING	ENGAGE IN BROKERAGE	TYPES OF EQUIPMENT BROKERED	IN-HOUSE MAINTENANCE SERVICE	OTHER PROVISIONS FOR MAINTENANCE	HANDLING OF MAINTENANCE CHARGES	DISASTER RECOVERY SERVICE	OTHER CONSULTING OR VALUE-ADDED SERVICES
Frank Orlando Jr. & Co. (312) 364-9220	20	All major brands	All	None	12-60	Operating	Yes	Yes	All	No	Third-party or manufacturer agreement	Separate contract	Yes	None
ROI Computer Co. (206) 232-6060	4	IBM, ITT Courier	Terminals	None	All	Operating	No	Yes	Communications terminals	No	Third-party agreement	Varies according to lease	No	None
REM Computers, Inc. (201) 528-5455	2	IBM, Amdahl	Modems, switchboards	None	1-60	Operating	No	Yes	Processors, peripherals	No	No	NA	No	None
Software Funding International, Inc. (312) 480-7170	NA	IBM, DEC, Unisys, Zenith, others	Novell systems	CAD/CAM	24-60	Operating, finance	Yes	Yes	Software, hardware, consulting, maintenance	No	Third-party agreement	Included in lease or separate contract	No	Setup of master vendor programs
Source Data Products, Inc. (415) 326-7333	8	IBM	Modems	None	1-60	Operating, finance	Yes	Yes	Processors, peripherals	No	Third-party or manufacturer agreement	Included in lease or separate contract	No	Hardware installation and deinstallation, systems analysis
St. Joseph Leasing Corp. (703) 836-7880	12	IBM, DEC	None	None	—	Operating, finance	Yes	No	NA	No	No	NA	No	Financial, systems consulting
Stamford Computer Group, Inc. (203) 324-9495	9	IBM, DEC, Apple	AT&T, Continental Phone (digital)	None	24-60	Operating, finance	No	No	NA	No	Yes	Separate contract	No	None
Systems Marketing, Inc. (602) 468-8800	55	IBM, DEC, Honeywell Bull	AT&T switches	—	12-60	Operating	No	Yes	Processors, peripherals	Yes	Third-party or manufacturer agreement	Separate contract	No	None
Suba II, Inc. (312) 382-2800	8	IBM, others	All	None	12-60	Operating, finance	No	Yes	Any	No	Yes	NA	Optional	None
Systems Discount & Leasing Corp. (716) 394-8510	7	IBM	None	None	—	Operating, finance	No	Yes	Mainframes	No	IBM maintenance	NA	Indirect	None
TBC Corp. (408) 446-9619	11	Amdahl, IBM, Memorex, Storage Technology, CDC, Telex	All IBM, multiplexers, modems	CAD/CAM, ATM	1-60	Operating	No	Yes	Processors, peripherals	No	Third-party agreement with manufacturer	Separate maintenance contract	No	Systems assurance, after-tax financial analysis
Technology Finance Group (203) 226-7501	50+	IBM, DEC, Unisys, HP, Memorex, CDC, Storage Technology, Computervision	Modems, multiplexers, front-end processors, switches	CAD/CAM, high-tech medical	36-60	Operating, finance	Yes	Yes	Processors, peripherals, communications	No	Manufacturer agreement	Separate contract	No	Hardware consulting
Transnational Computer Leasing (212) 489-8710	9	IBM	Any IBM	None	Up to 48	Operating, finance	Limited	No	NA	No	Third-party agreement	Paid directly to maintenance company	No	None
Tyus Corp. (703) 255-1122	8	IBM, DEC, Honeywell Bull	All, including modems, multiplexers, terminals, control units	None	12-60	Operating, finance	At customer request	Yes	Processors, peripherals	No	Manufacturer agreement	Through manufacturer	No	Freight refurbishing
Unicom Computer Corp. (415) 332-2585	60	IBM, DEC, Tandem, Xerox, AT&T, Memorex	All	CAD/CAM	1-60	Operating, finance	Yes	Yes	Processors, peripherals, communications	No	Third-party agreement	Included in lease or separate contract	Yes	Installation planning, reconfiguration, site movement, portfolio management, system upgrades
Unimark, Inc. (800) 255-6356	24	IBM, NCR	All IBM	—	12-60	Operating, finance	Only with hardware	No	NA	On IBM printers only	No	Included in lease or separate contract	No	None
Universal Computer Systems, Inc. (203) 227-0841	3	Any	Networking equipment	Banking, ATM	1-60	Operating, finance, capital	No	No	NA	No	No	NA	No	None
Universal Financial (800) 558-5656	41	Unisys, Convergent	Unisys	ATM, CAD/CAM	12-60	Operating, finance	No	Yes	Processors, peripherals	Yes	Third-party agreement	Included in lease or separate contract	Yes	Capacity planning, systems analysis, data communications, installation and deinstallation
URS Information Systems, Inc. (617) 438-4300	40	IBM	None	None	1-60	Operating	No	Yes	—	Yes	Third-party or manufacturer agreement	Separate contract	Yes	None
USL Data Systems, Inc. (415) 572-6664	325	IBM, Televideo, Epson, DEC, Xerox, Codex, Hayes, Compaq, Grid, AT&T, Amdek, Princeton, Quadram	Modems	Monitoring equipment	1-60	Operating, finance	Some CAD/CAM	Yes	Processors, peripherals	Yes	Yes	Included in lease or separate contract	Yes	24-hour replacement, centralized calibration lab, hotline service
Valley Computer & Financial, Inc. (612) 894-3200	6	IBM	None	Point-of-sale	Up to 60	Operating, finance	No	Yes	Processors	No	Third-party or manufacturer agreement	Separate contract	No	Installations, deinstallations, upgrade services
Duane Whitlow & Co. (214) 881-4381	4	IBM	Any IBM	ATM	—	Operating	No	Yes	—	No	No	NA	No	None
Willow Associates, Inc. (215) 886-1520	8	IBM	All IBM	ATM, CAD/CAM	24-84	Operating, finance	Yes	Yes	All	No	Third-party or manufacturer agreement	Separate contract	No	Hardware consulting
Xerxes Computer Corp. (612) 936-9280	35	IBM, NCR, Decision Data, CDC, Printronix	Modems	None	—	Operating, finance	Yes	Yes	Processors, peripherals	Yes	Third-party agreement	Included in lease, separate contract	No	24-hour technical support for hardware, parts sales, support for SSP operating system

VENDOR VIEWPOINT
In defense of income funds

BY GUS CONSTANTIN

Income fund-based leasing programs have proliferated since the Tax Reform Act of 1986, creating an undercurrent of controversy within the computer industry.

While some equipment lessors may rightfully criticize the new syndication players' lack of experience, they also overstate the problem, attacking the practice of income fund-based leasing without qualification and without reference to the successful track records of established income fund lessors.

Most of these condemnations are based on two assumptions. The first is that the misuse of income funds will artificially drive lease rates down, reducing equipment values and profits throughout the industry. The second is that this misuse could also expose investors to disappointing returns. If either of these hypothetical events occurs, the argument goes, lessees could be placed in jeopardy when upgrades, renewals or early buyouts become desirable.

Ingenues' mistakes

These criticisms are not without basis. Following the passage of the Tax Reform Act, income funds flourished, swelling the number of leasing partnerships from a dozen or so to almost 30. And there is little question that many companies new to income fund leasing make mistakes that experienced companies would not. They invest in only one or two types of equipment, for example, or they invest in too few equipment vendors. Fluctuations in residuals for this limited portfolio could jeopardize the entire partnership.

Experienced and responsible syndicators, however, focus on creating diversified equipment portfolios that have the potential for generating above-average returns with relatively low risk.

Experience players also know how to spread residual risks to protect investors. They may concentrate on different types of equipment or types of lessees; they might strike a balance between the types of leases offered or structure joint ventures, in which several limited partnerships participate in large transactions to limit the investors' exposure on any given piece of equipment or equipment lease.

The trouble with money

Because of the inexperience and instability of some newcomers, potential lessees or vendors may worry about the ability of these syndicators to continue to raise the equity needed to support a major program. However, a leasing syndicator backed by numerous, successful partnerships is likely to generate a substantial cash flow and will not need to rely on equity from new partnerships.

Recently, concern has been raised over a syndication lessor's increased risk of bankruptcy and the potential for lessees to face litigation from investors in a bankrupt partnership.

In the event of bankruptcy, any debtor (be it an individual, corporation or limited partnership) may either assume or reject an existing lease transaction. In fact, assuming the equipment had been placed in service prior to the partnership's bankruptcy, its continued leasing would be in the best interest of the bankrupt entity, the lessee and the trustee in bankruptcy. It is simply a question of whether the lease is advantageous to the debtor.

Furthermore, to extend liability to a lessee for investment losses would be an unprecedented extension of the law. The failure of the limited partners to realize a return on their investment would not be reason for action against the lessees.

Many readily available sources exist for a lessee to review the background of an income fund lessor including, in most instances, regular reports filed with the SEC. Credibility and reliability are not based on the lessors' method of raising equity but rather on the success and track record of the company. •

Constantin is chairman, president and chief executive officer of Phoenix America Corp., the parent company of Phoenix Leasing, Inc., a San Rafael, Calif., equipment leasing syndicator.

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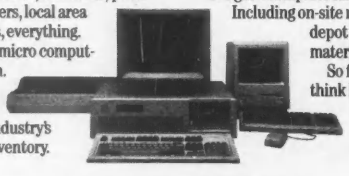

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- **PS/2 and OS/2:** Their current state (and problems) have been well documented, but what will they grow into—and has IBM truly responded to customer needs with this combination?
- **IBM's newly created Applications Systems Division,** which seeks to (among other goals) aid non-IBM software vendors as they develop applications. How far along is it, and what is the expected effect on the market?
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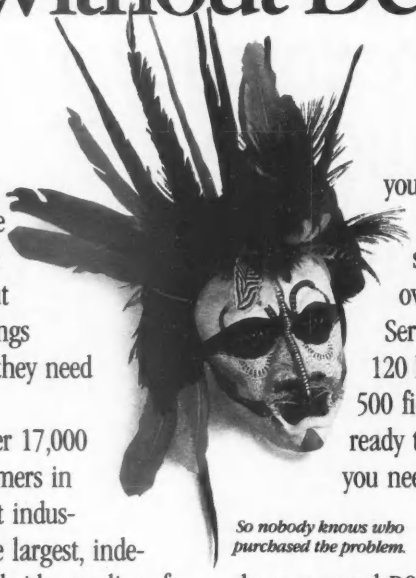

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HARD TALK

James Connolly

Watch those numbers

Somebody better buy an awful lot of computers between now and New Year's Eve.

Well, maybe not that many; just about $7 billion more than what recent forecasts say U.S. companies are buying. That is what it will take to reach the $49 billion mark in 1987 that was predicted for U.S. shipments back in the glory days of 1983.

Memories of those wild and crazy days burst into the open recently with the discovery (during a major reorganization of a journalist's desk) of an undated market research report from around 1983, when mainframe sales grew steadily and personal computer sales boomed at 30% annual growth rates.

The report, based on 1982 sales, said the value of U.S. shipments would soar from $22.6 billion in 1982 to $49.1 billion in 1987, based on compound annual growth rates ranging from 5.2% for mainframes to 36.9% for PCs. The figures in the 4-year-old report were typical for the era, so the market research company that released them, International Data Corp. (IDC) in Framingham, Mass., is not

Continued on page 89

NCR FTS 2 targets large banks

Branch processing system based on 32-bit Tower supermicro

BY ALAN ALPER
CW STAFF

NEW YORK — In an effort to increase its penetration of large banks, NCR Corp. recently unveiled the second generation of branch automation systems based on its Tower supermicrocomputer.

The Financial Tower System (FTS) 2 is built around either the 32-bit Tower 32/400 or the 32/600. Both are workstations based on the Intel Corp. 8088-2 and 80286 and peripherals modified for banking applications.

The system is designed to help banks deliver customer information and new services at the teller and customer-service levels, according to NCR.

With merger and acquisition fever sweeping the banking industry, it has become vital for NCR to focus more resources on larger institutions, according to Raymond Miolla, vice-president of NCR's financial systems division.

'Major competitor'

"NCR has had good success with medium-to-small institutions," Miolla said. "We want to be a major competitor for larger institutions in the U.S."

The Unix-based FTS 2, like all Tower systems, features an open architecture, which can be modularly expanded with additional processors and peripherals. The system's flexibility enables banks to tailor third-party or in-house-developed applications so they can offer a variety of services and products to differentiate themselves from the competition, noted Michael Gipson, director of branch automation systems at NCR.

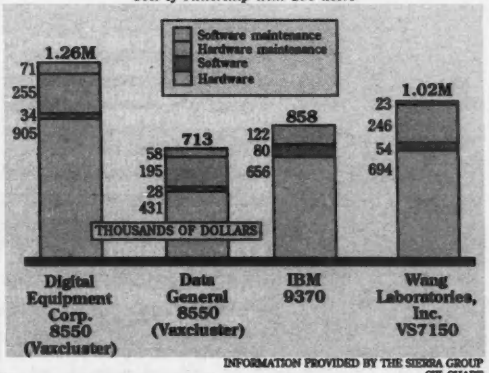
FTS 2 allows bank tellers to make deposits, withdrawals and account inquiries, access balance statements and perform end-of-the-day processing at their windows. Customer service personnel can open new accounts and offer financial advice based on

Continued on page 89

Data View

Departmental office systems

Cost of ownership with 100 users



INFORMATION PROVIDED BY THE SIERRA GROUP
CW CHART

Elxsi offers disk striping

SAN JOSE, Calif. — Elxsi Corp. recently introduced a disk subsystem, including an 823M-byte disk drive and controller that supports disk striping, for use with its System 6400 minisupercomputer.

The subsystem consists of the M2101 controller and the 2157 disk drive and was designed to provide particular benefit to customers with data base and multiuser applications.

Up to eight of the 823M-byte drives can be attached to a controller, and a two-controller system will provide 13.2G bytes of

Continued on page 88

Ultimate signs as 9370 VAR

BY STANLEY GIBSON
CW STAFF

EAST HANOVER, N.J. — The Ultimate Corp. recently said it has signed an agreement to remarket IBM's 9370 minicomputer with Ultimate's Pick Systems-based operating system.

Ultimate will buy the departmental processors from IBM and sell them with the Ultimate operating system to its network of dealers. Adding applications for use in different industries, the dealers will in turn sell the processors and operating system to end users.

The agreement will bring the thousands of applications offered by Ultimate dealers to the 9370, a critical requirement for the much-heralded machine's success, according to Theodore M. Sabarese, president of Ultimate.

"The 9370 puts them [IBM] in a funny position. It fits into the [370] family, but there are no ap-

Continued on page 88

Inside

- Precision Standard Time offers timing device for VAXs. Page 86.
- MAI Basic Four targets PC users with supermicros. Page 86.
- Ideassociates enters IBM System/36, 38 terminal market. Page 88.

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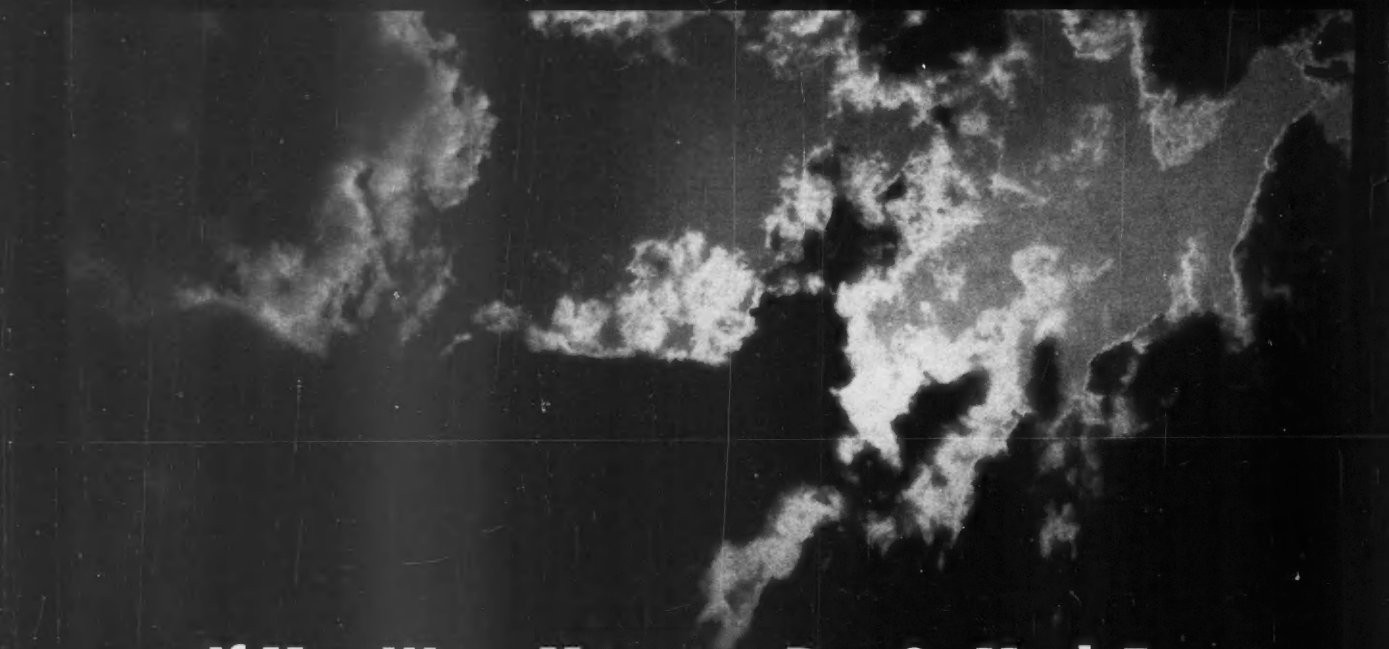

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MCDONNELL DOUGLAS

HARD BITS

IBM drops cloak on low-end product performance figures

The recent **IBM** tactic of releasing system performance numbers — a subject IBM steered clear of for so long — has been extended to the lower half of the IBM product line.

The numbers lack a base line for comparison, such as similar measurements for competing products, particularly since IBM used its own Ramp C transaction processing benchmark.

However, IBM says, the results show the System/36 5360 Model D with 24 active workstations getting two-second response times for a cost of $34 per transaction/hour.

The System/38 Model 200 with 24 users getting two-second response times showed a cost of $43.90 per transaction/hour, according to company officials.

What are the key factors that swing users toward **Digital Equipment Corp.**?

One is the DEC VMS operating system, which is "extremely important" or "very important" to 84% of the DEC customers surveyed on behalf of the DEC-compatible products show Dexpo.

The survey probably did not surprise anyone in showing that the percentage of DEC users running VAX minicomputers has climbed from 69% in 1984 to 85% in late 1986.

The product lines that are suffering include those in the DEC PDP-11 family, which were run by 53% of the users in 1985 and only 46% in 1986, according to the survey.

However, the PDP-11 is not dead, according to the users, 10% of whom said they planned to add an average of six PDP-11s this year.

While the PDP-11s fit into DEC's "I'm not dead yet" category, the company's VT220 terminal will not be so lucky.

DEC announced the VT320 as a replacement for the VT220 in August and said the VT220 will be available only to fulfill existing contract requirements through June 1988.

Only a few days later, the company produced its one millionth VT220, which was encased in a gold-colored enclosure for display at Decworld '87 and is being donated to the Smithsonian Institution's National Air and Space Museum.

At the museum, it will be used as the control terminal for the computer system that controls automated audiovisual displays. What type of computer is that? A dual PDP-11, of course.

Tektronix, Inc. has consolidated its Computer-Aided Engineering Systems Division with the announcement that its Santa Clara, Calif., and Austin, Texas, operations will move to the division's Beaverton, Ore., headquarters.

The company, which builds Worksystem electronic-design systems based on hardware platforms, including Digital Equipment Corp. VAX and Apollo Computer, Inc. Domain processors, is being centralized in Beaverton so it will be in closer proximity to other Tektronix groups, according to officials.

Star Technologies, Inc. recently announced a contract to supply the U.S. Naval Ocean Systems Center (NOSC) with eight Star ST-50 array processors.

The Star equipment will be used in NOSC's Low-Frequency Array program, which is aimed at improving the Navy's anti-submarine warfare capabilities, according to the company.

Encore Computer Corp. recently signed an agreement with **VMark Software, Inc.** through which Encore hopes to move into the Pick Systems Pick environment.

Encore will use VMark's Uni-Verse relational data base management system on the Encore Multimax line of parallel processors. Uni-Verse costs $9,600 for a 32-user package.

Scientific Computer Systems Corp., the San Diego-based near-supercomputer maker, recently signed a joint marketing agreement under which it will offer The MacNeal-Schwendler Corp.'s MSC/Nastran on the Scientific Computer SCS-40.

MSC/Nastran is a finite element analysis package for a variety of engineering applications.

Apollo Computer, Inc. and **Convex Computer Corp.** recently announced a joint agreement under which Apollo workstations and Convex near-supercomputers will be offered as a networked package based on Apollo's Network Computing System.

Unisys to service VAX processors

BLUE BELL, Pa. — Unisys Corp. recently added a series of Digital Equipment Corp. VAX minicomputer systems to the list of products the firm services in the U.S.

Unisys, which previously provided service for DEC PDP-11 and Microvax II systems, announced plans to service DEC's VAX-11/700 series of processors.

The processors have an installed base of more than 35,000 U.S. customers, including those using CPUs such as the VAX-11/750 and 11/780, according to the company.

The VAX service will be available initially only in areas with concentrations of VAX users, including major cities.

The service is offered under Unisys's Customcare third-party service program, which was launched in January 1985 with the aim of supporting customers running a variety of non-Unisys machines.

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Precision Standard adds timer aimed to cut VAX data loss

FRÉMONT, Calif. — Precision Standard Time, Inc. recently introduced a timing device designed to synchronize clocks and control data loss or errors in networks composed of Digital Equipment Corp. VAX minicomputers.

The Time Source scans radio signals transmitted by the National Bureau of Standards to synchronize system clocks to within 10 msec of the Coordinated Universal Time.

The product tracks the drift of system clocks from the proper time and adjusts the clocks when necessary, according to the vendor.

Punching the clock

The device helps to assure accurate time stamps on transactions, thus improving the accuracy and reliability of event logs, Precision Standard said.

Company officials commented that accurate time stamps are important in the creation of chronologies when tracking a hacker's activities and in eliminating data errors during activities such as automatic backups.

The product is Precision Standard's first computer-related product.

First computer product

The company previously sold Time Source-type devices that were targeted at equipment used in applications such as seismic monitoring and processor control.

The Time Source reportedly consists of an analog receiver and a microprocessor-controlled digital signal processing section in addition to VAX-resident software.

It ties to the system through an RS-232C serial port and costs $1,495.

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MAI Basic Four unveils supermicro

TUSTIN, Calif. — MAI Basic Four, Inc. recently introduced a multiuser supermicrocomputer designed to provide a transition for customers whose needs have outgrown personal computers.

The MAI 1800 utilizes the vendor's BOSS/IX operating system and Microsoft Corp.'s MS-DOS, allowing use of popular PC software such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III.

MAI Basic Four officials said the MAI 1800 was designed for small businesses that need an integrated, multiuser business system that features industry-specific applications offered through MAI Basic Four.

AT compatibility

The supermicro uses IBM Personal Computer AT-compatible hardware, including a 10-MHz Intel Corp. 80286 microprocessor.

The vendor claimed that the system supports up to 18 users and features disk capacities ranging from 31M to 230M bytes.

What the vendor called a typical three-user system — with 1.6M bytes of memory, a 58M-byte hard disk drive, a 60M-byte tape backup, a monochrome monitor, two terminals, a printer and MS-DOS and BOSS/IX licenses — costs $13,115.

Kodak makes cuts for KEEPS

ROCHESTER, N.Y. — Eastman Kodak Co. recently announced a string of price cuts and hardware and software enhancements for its Kodak Ektaprint Electronic Publishing System (KEEPS), including a 28% price cut on the entry-level KEEPS configuration.

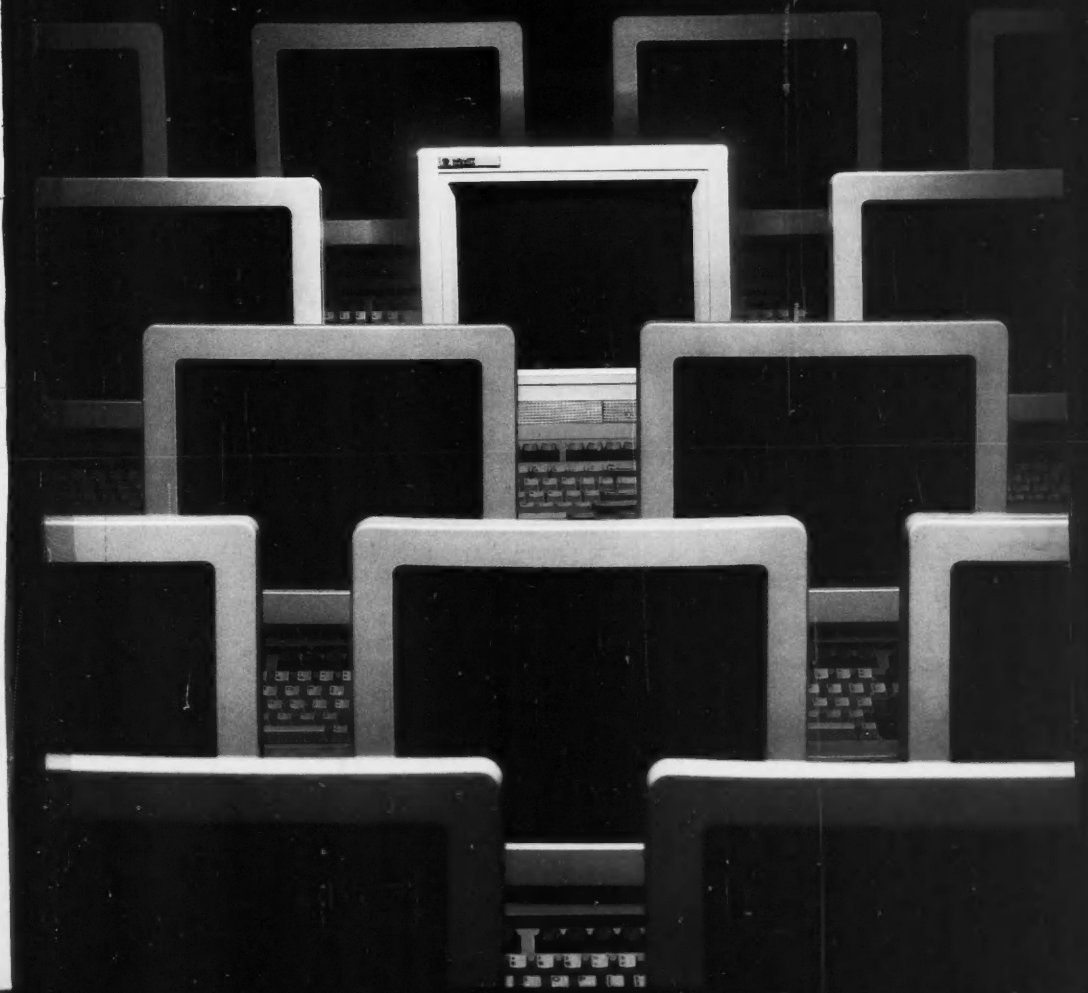
Kodak claimed that the price cut, to $19,900, on the Ektaprint 1104/71 document-composition station makes it the first engineering-based publishing system priced under $20,000. At the same time, Kodak introduced a second entry-level product, the $24,000 Ektaprint 1104/142.

Included in the software announcement was the product's ability to interface with systems ranging from microcomputers to mainframes. The update to the KEEPS software is free of charge to existing customers and allows previous stand-alone KEEPS systems to tie into existing corporatewide networks.

Kodak also introduced a software driver that interfaces KEEPS with printers using Adobe Systems, Inc.'s Postscript page-description language. It costs $2,500.

The company announced the Ektaprint 1530 scanner, which was designed to allow cropping and manipulating of the image as well as fast, low-resolution preview scan at 75 dot/in. for developing rough layouts. Prices start at $6,000.

All clone-priced terminals
are not created equal.



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(See next page for more.)
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HP 700/22
DEC VT220 Compatible Terminal

Compatibility Modes
VT220 mode, 7-bit controls
VT220 mode, 8-bit controls
VT100 mode
VT52 mode

Keyboard
VT220 style 106-key layout
Tactile feedback

Ergonomics
14-inch anti-glare screen
Green, amber or soft-white display
Tilt and swivel
Selectable 50, 60 or 72 HZ refresh rates
Front panel controls
Detached adjustable keyboard

Additional Features
4 pages of display memory
80 or 132 column display
30 programmable function keys
Easy setup menus
RS232C and 20m current loop interfaces
9-pin RS232C printer port

Other
1 year warranty
Jump or smooth scroll
Compose character capability
Nonvolatile memory for saving setup
National language layouts available

DEC VT220, VT100 and VT52 products of Digital Equipment Corporation
DEC is a registered trademark of Digital Equipment Corp.

HP 700/71
IBM 3191 Compatible Terminal

Compatibility Modes
IBM 3191 Models A and B, Display Station
IBM 3270 Information Display System, coax connection

Keyboards
IBM style 102 and 122 key layouts
24 programmable function keys for application use
Tactile feedback

Ergonomics
14-inch anti-glare screen
Green or amber display
Tilt and swivel
Front panel controls
Detached adjustable keyboard

Additional Features
Security lock and keys
Automatic screen saver
Easy setup menu

Other
1 year warranty
Nonvolatile memory for saving setup information
National language layouts available

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HP 700/41
Entry Level ASCII Terminal

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TeleVideo 905, 910+, 925E
Lear Siegler ADM 3A, ADM 5
Hazeltine 1500
ADDS Viewpoint A2
Qume QVT-101

Keyboard
Enhanced 106 key layout
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58 programmable keys
Tactile feedback

Ergonomics
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Green or amber display
Tilt and swivel
Front panel controls
Detached adjustable keyboard

Additional Features
2 standard RS232C ports
Split screen capability
Easy setup menus

Other
1 year warranty
Variable smooth scrolling
Copy and transparent print modes
Nonvolatile memory saves setup, programmed key info
National language layouts available

WY-30 product of Wyse Technologies Systems
TeleVideo 905, 910+ and 925E products of TeleVideo Systems, Inc.
ADM 3A and ADM5 products of Lear Siegler Corp.
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COMPUTERWORLD

Ultimate

FROM PAGE 83

plications for it. Bigger . . . DP installations don't have any software for the 9370," he said.

Applications for the 9370 are necessary for IBM in its defensive strategy toward Digital Equipment Corp., Sabarese added, saying, "IBM has been impacted by DEC, with its integrated family of computers, which contrast with IBM's disjointed machines."

The Ultimate 370 Operating System is an enhanced version of the Pick operating system, which includes relational data base management features, according to Ultimate.

To run the operating system on the 9370 requires the addition of a special board to run asynchronous terminals, Sabarese said. A user can run the Ultimate operating system under IBM's VM operating system or by itself, he said.

Ultimate has been selling 4300 machines for more than a year, Sabarese said. "The 9370 machines are even more appropriate for our market — small to mid-size companies or distributed data processing applications for larger companies," he concluded.

GBT mag tape out

IRVINE, Calif. — General Business Technology, Inc. recently announced a magnetic tape subsystem with a 1M byte/sec. data transfer rate for the IBM System/38 processor.

The GBT 4422 subsystem includes a controller made by General Business Technology and tape drives made by Storage Technology Corp.

The subsystem, which emulates the IBM 3422 or 3430, connects to the System/38 with an IBM 7970 tape attachment. The 4422 also features a 256K-byte cache buffer and dual-density recording formats.

General Business Technology claimed the 1M byte/sec. data transfer rate is faster than that of any drives currently available for the System/38, pointing out that the 3422 operates at 780K byte/sec. and that the 3430 runs at 312K byte/sec.

The 4422 reportedly is being shipped in the third quarter. The Model A01 tape controller/tape unit is priced at $32,000. Additional Model B01 tape units are priced at $16,600 each.

Ideassociates expands IBM-compatible line

BILLERICA, Mass. — Ideassociates, Inc., which previously sold personal computer-based emulation products for IBM minicomputers, has expanded its offerings to include terminals designed for use with IBM System/34, 36 and 38 processors.

The company claimed that its Idea 197 terminal series is functionally superior to the IBM 3197 monochrome display.

Ideassociates President Gautum Gupta said the high-end Idea 197-PT terminal allows any serial or parallel PC-scale printer to emulate an IBM 5219 system printer. It also reportedly allows emulation of the IBM 5224 and 5225 printers with graphics support and emulation of the IBM 5256 printer.

The Idea 197-PT and the Idea 197-2 include a split-screen capability that allows users to view two host sessions simultaneously. The Idea 197-1 features one IBM 3180 display session. The terminals include a 14-in. display, 80- and 132-col. display modes and international keyboard support for 122-key keyboards.

The Idea 197 terminals are covered by a three-year return-to-factory warranty. Suggested prices are $1,195 for the 197-1, $1,295 for the 197-2 and $1,495 for the 197-PT.

Ideassociates also markets System/36 and 38 links for personal computers.

Elxsi offer

FROM PAGE 83

storage, according to Elxsi. Disk striping involves the spreading of a file across multiple disk drives so the host can achieve simultaneous I/O transfers through multiple controllers and take advantage of an aggregate bandwidth of 4.8M byte/sec.

The M2101 controller costs $18,000, and the 2157 disk drive costs $24,750. They are scheduled for limited availability by the end of the year and for volume shipments in early 1988.

IIS enhances workstation

HACKENSACK, N.J. — Intelligent Information Systems, Inc. recently added to its line of IBM 3270-type terminals with the announcement of a workstation designed to be plug-compatible with the IBM 3192 Model D display station, announced in February.

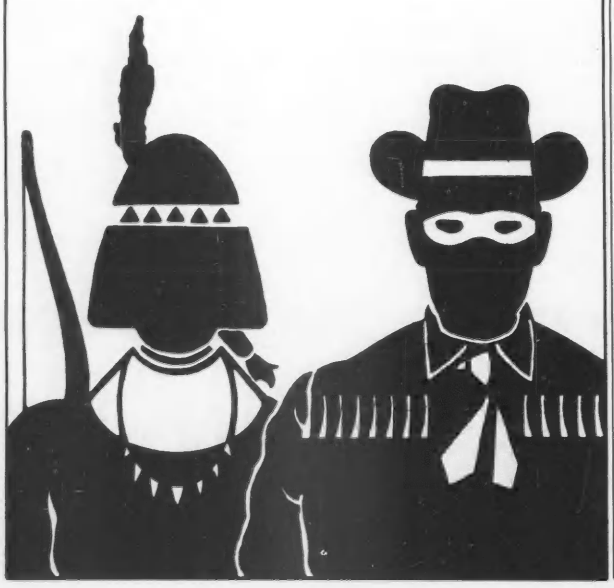
The IS-392D is interchangeable with the 3192 Model D via coaxial cables and IBM 3174, IBM 3274 or Intelligent Information Systems communications controllers, according to the vendor.

Company officials claimed the IS-392D is the most advanced monochrome workstation in the firm's product line, with four user-selectable screen formats and the capacity to display 3,564 characters.

The product also features a printer port for local screen copy, enhanced record/pause/playback of up to 1,500 characters and a rule function, according to the vendor.

The terminal has a suggested retail price of $1,595 with a one-year warranty and $1,695 with a three-year warranty.

A perfect combination is a rare thing...



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BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. **DOS** and **OS.**
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. **DOS** and **OS.**
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. **DOS** and **OS.**
BIM-FMAP — CICS BMS on-line map generation and maintenance. **DOS** and **OS.** NEW
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration.
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BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMSUBMT — On-line Job Edit and Submission facility.

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Watch

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being singled out for criticism. More recently, IDC projected 1987 shipments at $42.1 billion, $7 billion shy of the original prediction.

Those 30%-plus growth rates probably are gone forever, although what IDC calls "The Great Softness" has disappeared to be replaced by 7% U.S. growth and 9% worldwide growth this year. It is now accepted by many observers that the years of 30% growth were aberrations. Plenty of people on the computer vendor side learned they made the mistake of banking on the reverse.

But there are lessons for users as well. Some predictions are based on what MIS managers say they expect to buy. How many managers who planned for 25% to 30% annual growth for mainframe power actually added that much horsepower? Not too many, judging by the number of managers who said upgrades and acquisitions were put on hold in the past two years.

Not all of those plans could have been stalled by PCs, because IDC predicted back around 1983 that 56.7 million PCs would be in use in U.S. businesses in 1987 while IDC's most recent estimate is that only 53.8 million PCs are in use.

The bottom line is that people didn't buy as many computers as everyone expected four years ago.

Such glowing predictions during the best of times can also hurt managers in another way — by getting them to commit to technologies at least partially on the strength of faulty market projections. That happens when salesmen use market research numbers to convince a user company that a technology is booming. Commitments by that manager and his peers then skew the next set of market research numbers. When the technology fails to produce as expected, users are forced to take a new approach to meet their needs.

Therefore, a touch of caution is suggested for managers so they do not get too caught up in the promise of a technology simply because it looks good and a vendor has numbers to show that everyone will be using it in five years. Sometimes those numbers can be more than a little bit off.

Connolly is *Computerworld's* senior editor, systems & peripherals.

NCR FTS 2

FROM PAGE 83

analysis of various investment options and the customer's existing relationship with the bank.

Technology as a tool

"Banks used to use technology to accomplish mundane tasks, such as processing data faster. They now want to take technology and use it as a tool to improve their position in the marketplace," Miolla said.

FTS 2 can be built around the Tower 32/400, which uses the 16.7-MHz Motorola Corp. 68020 microprocessor with 8K bytes of optional cache memory, 8M bytes of memory and up to 185M bytes of disk storage, according to the company.

It can also be built around the Tower 32/600, which uses the same microprocessor but offers twice the storage and memory.

Two choices

The system comes with a choice of two Microsoft Corp. MS-DOS-compatible workstations.

One is NCR's 5067, an 8088-2-based machine with 512K bytes of main memory, expandable to 640K bytes, and a choice of two integrated 3½-in. hard or flexible disk drives.

The other is the 5267, an 80286-based unit with 512K bytes of main memory, expandable to 4M bytes, with the same choice of disk storage options as the 5067.

The workstations offer features specifically designed for financial institutions, including a small footprint to meet workspace constraints, a choice of 9-in. monochrome or color displays, a choice of two or three IBM Personal Computer AT-compatible expansion slots and a key-lock on the disk storage module for security.

The workstations also offer interconnection to financial peripherals such as magnetic strip readers and journal printers, data encryption and battery backup for added reliability, the firm said.

NCR is also offering a choice of IBM Token-Ring or Ethernet local-area networks (LAN) to attach teller and customer service workstations.

A variety of specially designed printers for financial applications are also available, the firm said.

Security measures

FTS 2 features layers of security to help banks guard against unauthorized access and manipulation of data, NCR noted.

For example, the access security option requires operator identification to be entered into the system prior to loading software.

A typical FTS 2 configuration, including six teller and six customer service workstations — with both the 5067 and 5267 — a Tower 32/400, acting as a file server and communications gateway to a host mainframe via IBM Systems Network Architecture, validation/administrative printers, a LAN, AT&T Unix System V and financial application software, is priced between $80,000 and $85,000, the firm said.

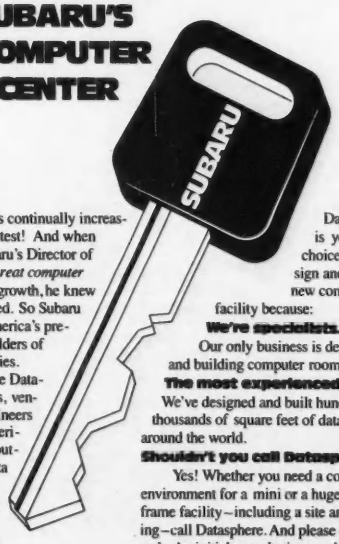
Both FTS 2 processors are currently available, NCR said, although the new workstations will not be delivered until the second quarter.

The firm's existing financial workstations are compatible with the system.

NCR first used Tower as its branch automation platform in late 1985 when it introduced systems designed around the 16-bit Tower/XP and Tower/Mini.

Hundreds of bank branches have installed the FTS 1 during the last 18 months, Gipson claimed, including Bay Banks, Inc. in Boston and Manufacturers Hanover Trust Co. in New York.

DATASPHERE WAS THE KEY TO SUBARU'S NEW COMPUTER CENTER



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Processors

A series of symbolic processing workstations featuring 16-in. integral color monitors has been announced by **Texas Instruments, Inc.**

The **Explorer II** color systems offer 1,024- by 808-pixel resolution and are capable of displaying 256 colors simultaneously, from a palette of 16.7 million. The color-system interface board provides a bit-mapped color frame buffer and controller.

Software support for color includes the Color Window System, the Color Graphics Editor, the Color Map Editor and special microcode to enhance performance.

Color systems are priced at $7,500 more than the list price of similarly configured Explorer II monochrome systems. Explorer II systems are priced from $49,900 to $99,900. Color upgrades for existing systems cost $12,950.

TI, P.O. Box 809063, DSG-157, Dallas, Texas 75380. 800-527-3500.

A 32-bit computer system said to feature random-access memory (RAM) expansion to 4G bytes and automatically backed-up RAM disk has been announced by **Digital Electronic Systems, Inc.**

The system, called the **Computerist Mainframe**, features an asynchronous main bus that allows expansion memory to be added through zero-insertion-force heavy-duty sockets. Additional memory and peripheral controllers are stacked on top of each other, forming the Stack Bus.

Based on a 25-MHz Motorola, Inc. 68020 with coprocessor and virtual paged memory mapping, the Computerist Mainframe uses Motorola's Versados operating system.

Prices for the product range from $8,950 to $144,500.

Digital Electronic Systems, 302 S. Main, Estill Springs, Tenn. 37330. 615-649-5137.

The **ICI Chameleon**, a Data General Corp. software-compatible system, has been announced by **Intelligent Computer Integration, Inc.**

The system is based on DG's Eclipse S20 CPU card. The prepackaged system comes with 2M bytes of main memory, a 147M-byte Winchester disk, a 16-port multiplexer, a parallel line printer controller and a ½-in. cartridge tape backup subsystem.

Pricing starts at about $10,000 for an eight-user entry-level system. An OEM version is also available.

Intelligent Computer Integration, 1901 Petra Lane, Placentia, Calif. 92670. 714-579-7575.

Data storage

A diskette duplication system has been introduced by **Applied Data Communications, Inc.**

The **DL4852/4835 Datalink** diskette duplication and translation system is said to allow users to copy data from a master floppy disk, local-area network (LAN), half-inch tape, hard disk, minicomputer or mainframe to 3½-, 5¼- or 8-in. diskettes. The Datalink can also compile data contained on multiple floppy disks and transfer it to half-inch tape or a hard disk.

Diskettes are copied and verified at a rate of 12 sec. per double-sided, double-density disk.

The base configuration consists of an Intel Corp. 80286-based CPU, 512K bytes of random-access memory, a 20M-byte hard disk drive, a 5¼-in. robotic disk handler with a 100-diskette input hopper, a keyboard, a monitor and software. It costs $26,500.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680. 714-731-9000.

Amperif Corp. has announced the **9000-IIB Mass Storage series**, which incorporates Fujitsu America, Inc.'s Swallow 5 1G-byte 8-in. disk drives.

According to the vendor, up to 32G bytes of rotating memory storage is achieved. In addition, up to eight CPUs can simultaneously access and share stored data when the series is configured in a mainframe environment.

The 9000-IIB Mass Storage series with dual controllers and a 16G-byte rotating memory capacity is priced from $150,000.

A dual-cabinet system with 32G bytes of rotating memory, full cache and full solid-state memory capacity costs $600,000.

Amperif, 9232 Eton Ave., Chatsworth, Calif. 91311. 818-998-7666.

The **CTS-8** family of tape subsystems for Digital Equipment Corp. VAX and Microvax computers has been announced by **Transitional Technology, Inc.**

The CTS-8 subsystems employ helical scan technology, allowing up to 2.3G bytes of data to be stored on an 8mm videocassette. Features include an error correcting code said to provide uncorrectable error rates of less than one bit in 10^{13}, a direct-read-after-write head, an integral 256K-byte buffer and a maximum transfer rate of 246K byte/sec.

Available now as a subsystem for Unibus and Q-bus VAX systems, the CTS-8 is priced from $5,995.

Transitional Technology, Suite 204, 1401 N. Batavia, Orange, Calif. 92667.

Printers/Plotters

A laser system designed for high-resolution graphics applications has been announced by **JRL Systems, Inc.**

The **340G High Res Laser System** features a Minolta Camera Co. 400 dot/in. laser print engine and a JRL laser controller. Print rates are said to be up to 20 page/min. in either 8½- by 11-in. or 11- by 17-in. formats. The controller provides two pages of raster memory, optional vector-to-raster conversion, various protocol conver-

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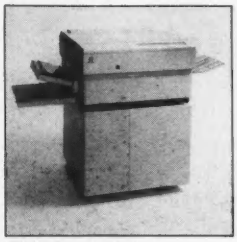

JRL's *laser system*

sions, three resident bit-map fonts and standard printer emulations.

The 340G High Res Laser System is priced from $13,900.

JRL Systems, 8311 Highway 71 W., Austin, Texas 78735. 512-288-0242.

A series of entry-level color plotting systems called the **Value Series** has been announced by **Versatec**, a Xerox Corp. subsidiary.

The Value Series 3000 features a controller integrated in the plotter, which includes 4M bytes of random-access vector memory. The RS-232C serial interface accepts vector data at rates of up to 38.4K bit/sec.

The plotters also accept the Versatec Data Standards format via a Centronics Data Computer Corp. parallel interface.

Electrostatic color plotters in the series are available in 200 and 400 point/in. resolutions in 24-, 26- and 44-in. widths.

Prices are $45,000, $55,000 and $65,000, respectively, for the 200 point/in. models. In 400 point/in. resolution, pricing is $55,000, $65,000 and $75,000, respectively.

Versatec, 2710 Walsh Ave., Santa Calra, Calif. 95051. 408-988-2800.

Honeywell Bull Italia has enhanced its **Honeywell Bull 4/66** color dot matrix printer.

Features of the 4/66 include bar code printing, automatic front loading of single sheets, a second bin for automatic sheet feeding, pull tractors for the handling of thick forms and zero tear off on fanfold stationery, the vendor said.

Other features include 24-in. form length, standard color facility and print speeds of 480 char./sec. in draft mode, 75 char./sec. in letter-quality mode and 180 char./sec. in near-letter-quality mode.

The enhanced Model 4/66 costs $2,400.

The second-bin option costs $333.

Honeywell Bull Italia, Suite 800, 120 Howard St., San Francisco, Calif. 94105.

The **TX2100 and TX2200** dot matrix printers, designed for IBM System/34, 36 and 38 minicomputers, and the **CX2100** and **CX2200** dot matrix printers, designed for IBM 3270 computers, have been announced by **Source Technologies, Inc.**

The TX2100 and TX2200, 80- and 136-col. printers, respectively, emulate the IBM 4214. The CX2100 and CX2200, also 80- and 136-col. printers, respectively, emulate the IBM 3287.

All models feature a 220 char./sec. print speed in draft mode and a 44 char./sec. speed in near-letter-quality mode.

Other features include document on demand, single-sheet and feed and a seven-color option.

The TX2100 costs $1,595. The TX2200 costs $1,695. The CX2100 costs $1,895, and the CX2200 costs $1,995.

Source Technologies, Suite 350, 5250 77 Center Drive, Charlotte, N.C. 28210. 704-522-8500.

A line of computer-image film recorders for producing 35mm color slides, instant prints, 4- by 5-in. and 8- by 10-in. prints or overhead transparencies from graphics and text generated by computer graphics workstations has been announced by **The Charles Beseler Co.**

The **4600 series** of film recorders operates with host computers featuring horizontal frequencies in the 15.75- to 20-KHz range.

Features include built-in red-green-blue analog compatibility, interchangeable, plug-in, preprogrammed camera modules and film data storage-programmable read-only memories, the vendor said.

The 4600 film recorder with 35mm camera model is priced at 44,235.

The Charles Beseler Co., 8 Fernwood Road, Florham Park, N.J. 07932. 201-822-1000.

A family of band printers designed for use with Digital Equipment Corp. VAX, Microvax and PDP systems has been announced by **Interscience Computer Services, Inc.**

The 1,500 and 2,000 line/min printers are manufactured by Dataproducts, Inc.

Paper handling capabilities include four tractors and a paper puller.

The 1,500 and 2,000 line/min printers cost $20,031 and $25,430, respectively.

Interscience, 5171 Clareton Drive, Agoura Hills, Calif. 91301. 818-707-2000.

The **Prima-TX** printer, designed for use with IBM System/34s, 36s and 38s, has been announced by **Printer Systems Corp.**

The dot matrix printers are available in 80- or 136-col. models, each with a 220 char./sec draft print speed and a 44 char./sec. letter-quality print speed. The printers attach to the system via twinaxial cabling.

The Prima-TX is priced at $1,395.

Printer Systems, 9055 Comprint Court, Gaithersburg, Md. 20877. 301-258-5060.

A line of desktop, eight-color dot matrix printers has been announced by **Interface Systems, Inc.**

The printers, called the **ISI 7224** line, are said to be 100% plug-compatible replacements for the IBM 4224. The Model 2C2, an IBM 3270 compatible, and the Model 1C2, for System/34s, 36s and 38s, offer a print-draft output of 400 char./sec. and a near-letter-quality output of 100 char./sec.

Features include 512K bytes of memory and a graphics resolution of 144 by 144 dot/in.

Each model costs $5,500.

Interface Systems, 5855 Interface Drive, Ann Arbor, Mich. 48103. 313-769-5900.

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PS/2 seeks to join crowded network market

IBM's activities may polarize LAN vendors' offerings

BY IAN EBEL

The IBM Personal System/2 Model 80 will profoundly affect the local-area network (LAN) market. It may not, however, have exactly the effect IBM was hoping for.

With the Intel Corp. 80386 chip, the mainframe power of IBM's 370 will be available on executive desktops everywhere. And if by "mainframe computing" we mean mostly IBM computing, the arrival of a desktop mainframe from IBM ought to be a major victory for the company's computing strategies. But it is not. Rather, it is a victory for IBM's marketers.

The fact is, no one would ever want the kind of connectivity crossword puzzle found in IBM mainframes to spread to personal computers. The idea of an IBM Systems Network Architecture (SNA) PC-to-PC network sounds absurd, not because SNA is too rich for the lowly PC to process but because, functionally, SNA is an embarrassment.

Currently available PC networks greatly surpass mainframe networks; they are superior in terms of price/performance, operating simplicity, cooperative processing support and overall flexibility.

Indeed, with the PS/2, IBM introduced a mainframe-level PC into a world already populated with robust connectivity solutions, most of which treat a mainframe from IBM and every other vendor as just another port.

This egalitarian environment tends to reduce the importance of the processor as a stand-alone device. Indeed, the very idea of a host starts to sound old-fashioned.

What you end up with is a network of workstations and special-function processors or servers. These servers perform tasks that are more cost-effective if they are shared among several workstations.

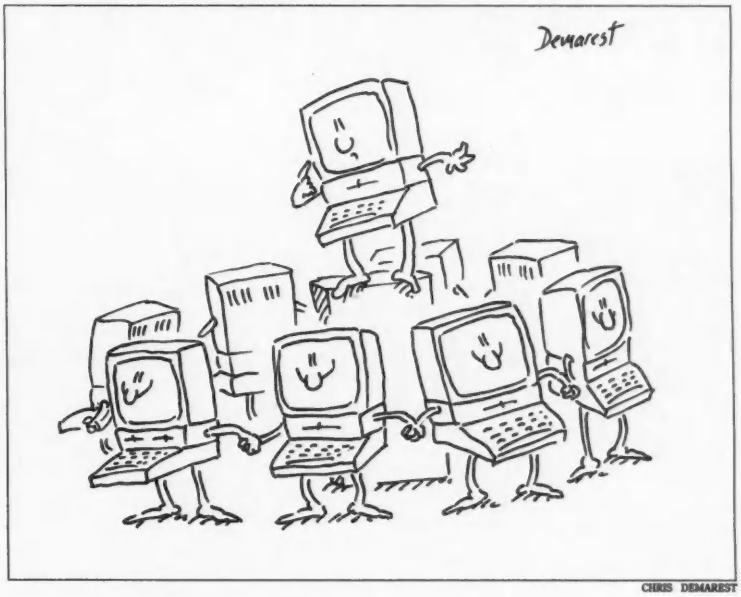
As network components, mainframe computers are simply boxes that sit in air-conditioned rooms. Just like the air-conditioning equipment itself, the computers will become commodity items. This trend will put an increasing margin pressure on IBM's most profitable products as it reduces their brand appeal in the marketplace.

Bypass routes

Therefore, the premise that the mainframe horsepower of the 80386 brings IBM-style host-driven computing to the world of PCs is false. It tends to do the opposite. In the hands of end users, that power makes it possible to effectively bypass the host to perform virtually all computing.

That power allows end users to bypass the organization that supports the host. With the 386 chip, users can introduce utility software that lets the non-MIS staff access powerful computer resources. Programs such as Microsoft Corp.'s Windows, Lotus Development Corp.'s The Applications Connection and IBM's Netview have already laid the groundwork for this level of access.

Novell, Inc.'s Netware product, for example, already achieves most of the goals spelled out in IBM's recent



CHRIS DEMAREST

Ebel is president of Microserv Technologies Corp., a network distributor in Needham, Mass. He is also president of The LAN Group, an international consortium of network specialists.

- **Low price vs. premium services**
- **IBM makes bypassing the mainframe easy**
- **New rival for Netware**

Systems Application Architecture statements of future direction. To wit, Netware already allows applications running on different machines, different networks and even different types of networks to not only communicate but also process cooperatively at high data transfer rates.

Soon, there will be a complete suite of application control programs that will let those who know nothing about computers perform jobs that today require an appointment with the MIS department.

No more high priests

So what happens to MIS when it is no longer needed to manage system complexities? When the system is no longer complicated, the role of MIS is diminished. Likewise, when computing no longer means using the computer but simply working at one's desk, the role of the host will also be diminished.

IN A MARKETING SENSE, mainframes will grow increasingly less visible as they become generic components in a seamless network. Buying a computer will be a lot less like buying a car and more like buying a telephone service.

In a marketing sense, mainframes will grow increasingly less visible as they become generic components in a seamless network. Buying a computer will be a lot less like buying a car and more like buying a telephone service.

Another attention-getting MIS role — already seriously challenged by the proliferation of PCs — has been that of information gatekeeper. With the PS/2, a technology will be in place that will almost completely return the control non-MIS department managers enjoyed before computers were invented. Software will be in place that will allow departments to qualify access to information based on departmental rather than MIS requirements.

Had such application control and LAN management software existed two years ago, it would have overloaded PC hardware resources. With the PS/2 Model 80 and other 80386-class machines, that will no longer be true.

Impact on IBM

As more power comes to PCs and networking becomes more complete, an increasing margin pressure will be brought to bear on IBM's most profitable products. Although this trend reflects a maturation of the computer industry in its life cycle, it is ironic that IBM should be such an active player in the erosion of its own business base.

Of course, as the leader in the industry, IBM is not without its options. If the computer business is turning more into a public utility like a phone service, one option is to own the phone line — in other words, the network. That is what IBM is trying to do — to the extent that it can — by making the PS/2 architecture proprietary.

If the PS/2 is not only proprietary but also a standard, there will be a compelling reason for customers to use other IBM components, such as host computers, for the network as well.

The effort to make the PS/2 proprietary is currently taking the form of a strategic alliance between Microsoft and 3Com Corp. as part of the overall development of OS/2. The result of this joint effort will be the emergence in the next 18 months of a competitor to Netview, the current LAN management standard.

That, of course, is IBM's real hope — to offer a complete solution and encourage users not to worry about how the pieces fit together. In other words, IBM should emphasize the applications delivery and de-emphasize the individual identities of its products. The more generic LANs become, the more difficult it will be for someone to sell only LANs, especially if IBM is offering the world's standard. IBM's margin would then be made on the delivery of the overall solution rather than solely on hardware profits.

The DEC connection

So how does the effect of the PS/2 on the LAN market affect Digital Equipment Corp.? In one sense, we have up to this point completely ignored the role of minicomputers. The situation can be summarized by saying that the networking world boils down to two contending cultures, mainframes and PCs.

IBM's mainframe supremacy will be hurt rather than helped by the arrival of mainframe power on a chip. DEC, however, no longer considers itself to be a minicomputer company, if it ever really did. Rather, it increasingly sees itself as an applications-driven networking firm.

More than IBM or any other firm, DEC has realized the strategy of treating processors as indistinguishable network components. With its Microvax, DEC has already proven that it is irrelevant whether the world's standard PC has a different instruction set than other processors on the network. Indeed, with the extra horsepower of the 80386, it will be even easier to wrap a foreign instruction set inside a software envelope that will make the chip look like a DEC VAX.

For DEC, there is simply no

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mainframe, PC or even minicomputer style of computing. There is only the DEC style, reflecting the belief that the user ought to be the primary beneficiary of computers.

Computers are not the real issue anyway. The real issue is what the user can do with computers.

DEC first brought that strategy to the computer marketplace in the 1960s with the minicomputer and interactive computing technology. So the minicomputer was never really the object in the first place; rather it was a strategy.

Today, the goal of computer accessibility is achieved on the basis of transparent networking. DEC's success in that area is now almost legendary.

The fact that DEC does not have to get its networking act together in other areas gives it a head start over IBM in the PC network arena, despite the fact that it will inevitably be the IBM Personal Computer that sets the standard.

AS LANs become more generic, third-party LAN suppliers, such as distributors — and their customers, the VARs — will be polarized.

Special opportunities

As LANs become more generic, third-party LAN suppliers, such as distributors — and their customers, the value-added resellers (VAR) — will be polarized. They will either compete entirely on a price basis, or they will compete on that of premium services.

Users will select a third party on the basis of price if the user is sufficiently large enough to internally handle installation and service. Users will also choose a source on the basis of premium services if they have special applications needs.

Vendors that can no longer compete on a general-systems level or companies attracted to niche opportunities because they have special skill sets will most likely find profitable opportunities in the special processors or servers industry.

In this growth area, the name of the game will be to find a solution that more closely matches the customer's need than the one-size-fits-all applications from the systems vendors.

Another area of growth, as Lotus and Microsoft have found, will be to fulfill the promise of cooperative processing, for which current LAN management software already provides the foundation.

This challenge will mean writing programs that specifically take advantage of the ability to share processing chores among applications, not just users, in different locations.

Ultimately, however, there will simply be fewer applications not already sold by the systems vendors. Increasingly, those vendors will be either IBM or DEC.

This pattern is clear as both IBM and DEC establish special industry marketing groups to drive their sales in targeted areas such as chemistry, aerospace and petroleum.

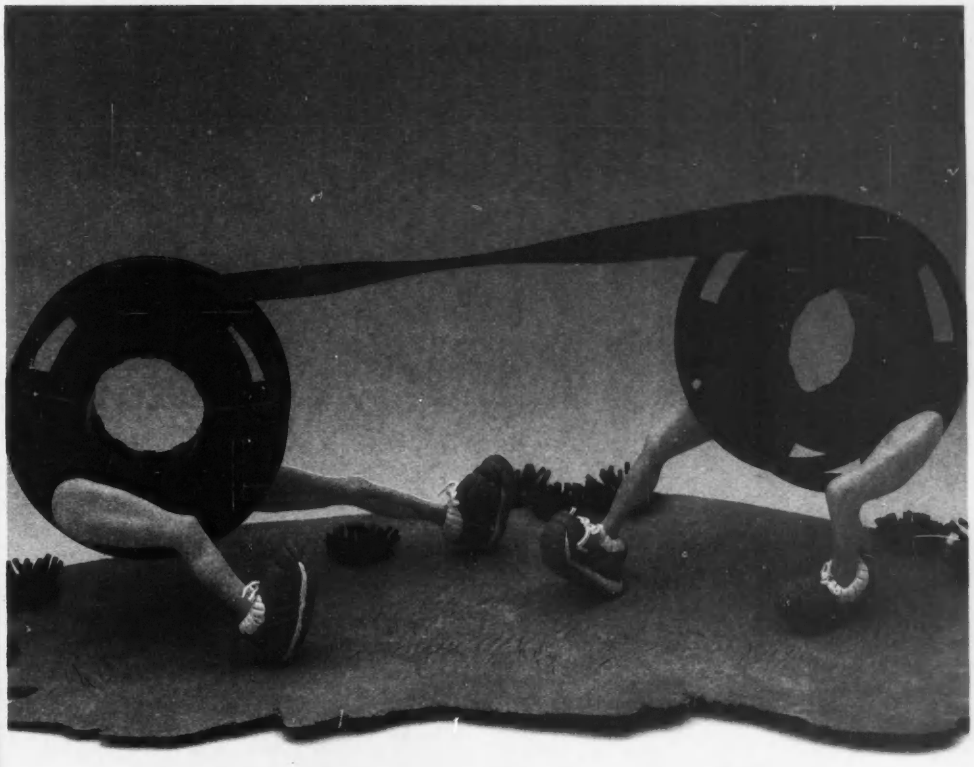
For the past several years, both IBM and DEC have made third-party software programs available that either supply their customers with applications directly or, at least, promise to enhance the demand of the system within the particular application area.

And the winner is . . .

It is no coincidence that connectivity is now the No. 1 topic in the computer trade press. The long-term winners will be those that can deliver information for the least amount of money and effort.

That is why the PS/2 is so important. The system removes the performance bottlenecks that until now stifled the expression of the inherently superior networking methods that are found in LANs.

Ultimately, those LAN methodologies will push SNA aside, just as SNA has pushed bisynchronous protocols aside. That will be the real legacy of the PS/2. •



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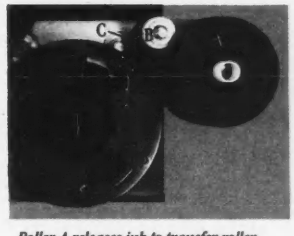

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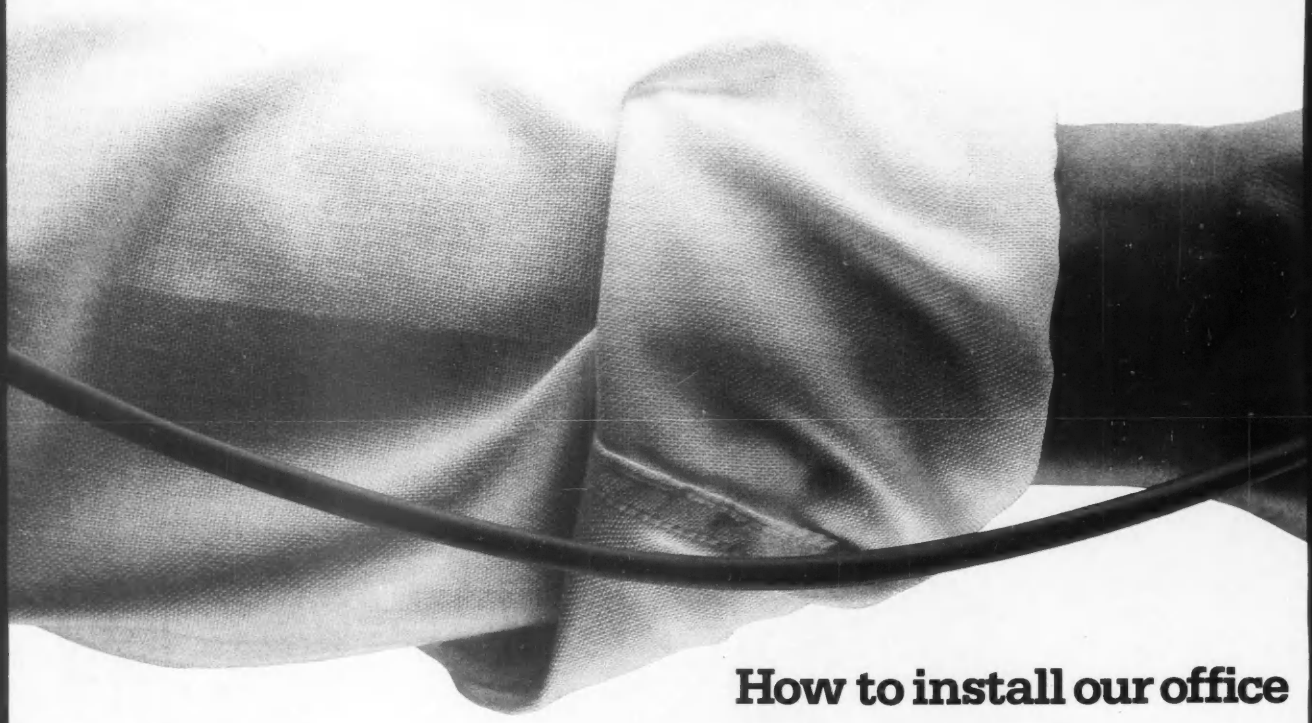

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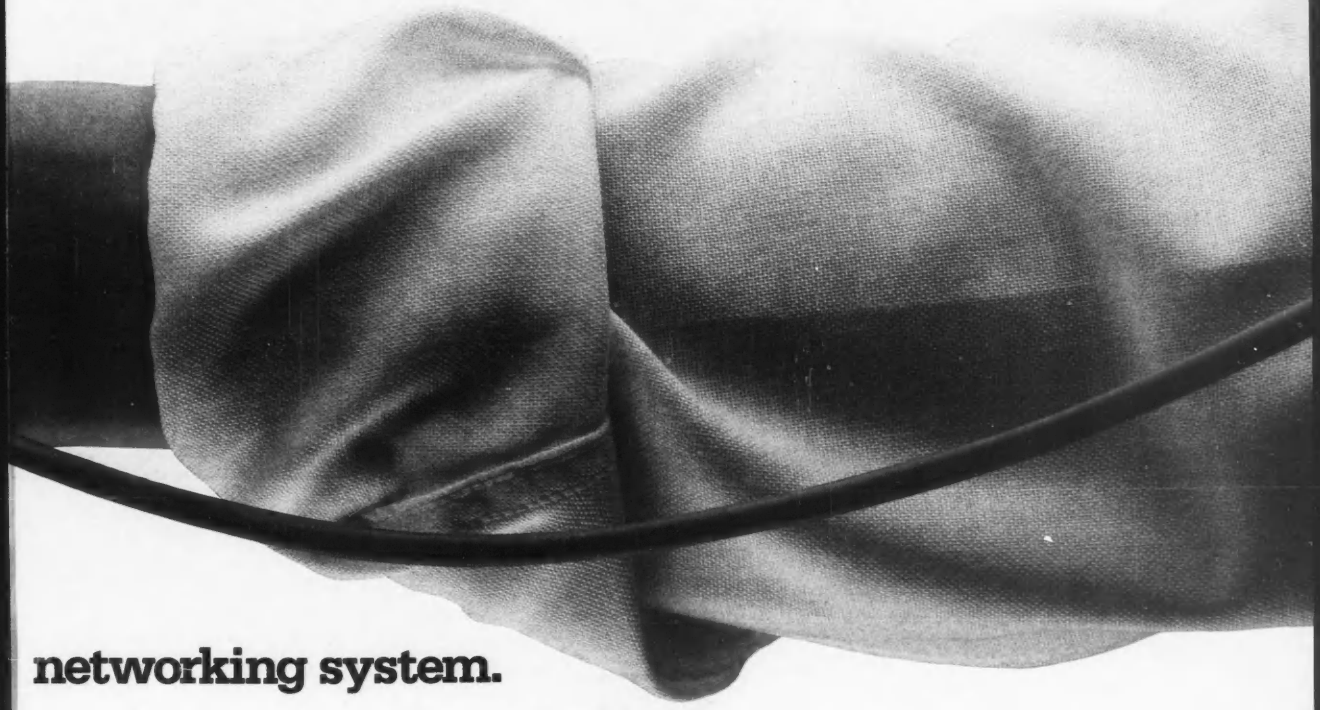

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Three vendors give Cray chase

In the race for CPU power, supercomputer makers are all trying to show they have the right stuff

BY BECKY BATCHA

At the very highest reaches of supercomputing, where vendors cannot stay in the running unless they are able to turn out billions of floating-point operations per second (GFLOPS), Cray Research, Inc. holds an astounding two-thirds share of the entire world market. But in a new round of competition that is now taking shape, a few aggressive challengers plan to chip away at Cray's market and eventually take a chunk for themselves.

"I don't think there's any doubt that it will be difficult for Cray to maintain the overwhelming market share that it's got right now," says Gary P. Smaby, managing director of Piper, Jaffray & Hopwood, Inc.'s technology group. Cray will remain dominant in the market, Smaby says, but it will lose some ground to other firms.

Right now, Cray sells its systems on performance alone, which seems to be sufficient practice at the top of the computing heap, according to Marcia Brooks, senior analyst at International Data Corp., a Framingham, Mass.-based data research firm. However, in the minisupercomputer market just below, users look for good price/performance, and Brooks expects the concern to creep upward.

If other vendors price their supercomputers aggressively, Cray will eventually lose some sales, Brooks says. Today, commercial accounts make up more than half of Cray's business, and, in business, cost-effectiveness is a major issue.

The new round of competition in high-end supercomputing will begin in earnest after Cray releases its Y-MP line early next year, and it will encompass the introduction of the Cray-3 line about a year after that. It will be characterized by huge leaps in peak processing power — from the 1 to 2 GFLOPS of today's fastest processors to the 10 and higher GFLOPS that are expected of the next generation's standard performers.

ALAN HOPKINS

Batcha is a free-lance writer based in Boston.

Analysts see Honeywell-NEC Supercomputers, Inc. (HNSX), ETA Systems, Inc. and Amdahl Corp./Fujitsu Ltd. as Cray's main competitors at the very high end. National Advanced Systems Corp. (NAS), which markets Hitachi Ltd. mainframes in the U.S., is often mentioned as a potential threat to Cray. But NAS company spokesman Chuck Mulloy says the firm has no plans at this point to market a Hitachi supercomputer here.

The roads to success

HNSX, ETA and Amdahl market high-performance vector processors like Cray's machines, and all three target the same broad user base that Cray does. Each has a reason to expect success:

- HNSX claims to produce the fastest single-processor machine in existence, the 1.3-GFLOPS SX 2-400. The company aims to always offer the fastest single-processor supercomputer, and it will soon sell multiprocessor versions as well, according to company spokesmen.
- ETA says it expects the leading-edge technology of its ETA-10 machines to carry the company comfortably into and through the next generation. The ETA-10s are based on CMOS circuitry and are cooled in liquid nitrogen to achieve high speeds.

ETA-10 models with 3.3 GFLOPS peak performance are shipping to customers this quarter, and the company expects to ship a 10-GFLOPS version by the middle of next year.

- Fujitsu supercomputers, which Amdahl markets in the U.S. and Canada, are by far the most popular supercomputers in Japan — a vital market in which Cray has placed only seven machines. Amdahl expects to attract North American business through competitive performance and attractive pricing.

Cray's outlook

Jeffry Canin, senior technology analyst at Hambrecht & Quist, Inc., says that despite the increased competition, Cray will hold on to at least 50% of the supercomputer market, which is growing at 30% to 35% every year.

Cray, however, says it has no plans to surrender any of its current share. "It'll be tougher for us, and there's no doubt about that," says Bob Ewald, the firm's vice-president of commercial marketing. He says the Minneapolis-based firm will try to stay ahead of its competitors by emphasizing what it sees as its greatest strengths:

- Raw performance.
- Memory capacity.

• New highs in the aggressive GFLOPS war

• Optimization vs. raw power

• Ease-of-use features around the corner

- A large applications library.
- Connectivity.
- A commitment to research and development.

Cray offers a peak performance of about 1 GFLOPS on its current X-MP series and about 1.9 GFLOPS on its Cray-2 line, according to Ewald. Standard Cray-2 machines support 2G bytes of dynamic random-access memory (RAM), and the Cray-2S line, announced this July, offers 1G byte of the speedier static RAM.

The Y-MP series should outperform the X-MP line by a factor of 10, Ewald says, and the Cray-3 line should increase performance one hundredfold from the Cray-2. In addition, the Cray-3 will provide between 2G and 4G bytes of memory, with memory technology that is even faster than static RAM, he says.

Cray's performance ratings will keep the company well in step with anything competitors have to offer, according to Hambrecht & Quist's Canin. He cautions against paying too much attention to peak performance, however, as does Ewald. Actual performance for any supercomputer is about 15% of peak for most applications, Canin says.

On the software front, Cray is in even better shape. Ewald says the company's catalog of proprietary and third-party applications lists more than 500 products. No competitor claims to support more than about 100 supercomputer programs. Canin says he sees software as one of Cray's biggest strengths and one of the competition's greatest weaknesses. "No one comes close to the depth and breadth of application code available [from Cray]," he says.

Competitors will need years to catch up, Canin says, given the size of the applications gap, the efforts required to tune the application for specialized supercomputer instruction sets and the reluctance of third-party software developers to write programs for any but the most popular machines.

The more, the stronger

Cray's software dominance arises naturally from its market dominance: The more machines a company puts in the field, the more applications users can write and the more applications third-party vendors will be enticed to write.

CRAY'S great strength may be its R&D commitment. While most vendors put 7% to 10% of revenue into product development, Cray invests a full 15%.

The same holds true for connectivity. Because Cray has installed more supercomputers than any other firm, it has attracted more networking attention than anyone else. Ewald lists IBM, Digital Equipment Corp., Sun Microsystems, Inc. and Apollo Computer, Inc. as some of the important platforms that can communicate with Cray machines.

Cray's last great strength may be its commitment to research and development. Whereas most hardware vendors put between 7% and 10% of their revenue into product development, Cray invests a full 15%. Ewald says the investment in R&D has kept Cray ahead of the pack technically and should continue to do so.

Pricing and exporting

About the only factors that might slow Cray down are users' demands for good price/performance and Cray's difficulties in international trade, especially with Japan.

Ewald says that although raw performance is more attractive to buyers at the very high-end than relative price/performance, Cray does recognize the need for attractive pricing throughout its line, particularly at the lower levels. The company says it plans to improve price/performance where it can by increasing performance more than it increases price.

Cray's second vulnerability lies out of its hands. Political shackles in the U.S. and abroad hold the firm back from competing overseas as aggressively

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as it would like.

On the home front, Ewald says, U.S. export-license restrictions bog down Cray's sales efforts. Although the government has never barred a shipment, it stalls the process at times. In 1986, Cray needed an average of 145 days to obtain a license to ship its machines abroad. Ewald wants to see the wait cut to 30 days.

Moreover, many supercomputer sales get tied up in international political wrangling. Right now, for instance, Cray is trying to sell into some accounts in India. While the company has almost settled the details with its customers there, before any machine can ship, the Indian and U.S. governments need to sanction the trade, and problems have come up.

India wants to receive a Cray X-MP/24. Yet, for security reasons, the U.S. wants to ship only the less sophisticated X-MP/14. It gets even more tangled: One U.S. senator tacked an amendment regarding Cray's Indian sales onto a bill that called for a nuclear nonproliferation treaty between India and Pakistan.

Super rivals

Among supercomputer vendors, Cray is far ahead in installed base but has dropped behind in terms of performance

Vendor	Model	Peak performance	Price	U.S. installations[1]	Worldwide installations[1]	Prospects
Cray Research	X-MP line	1 GFLOPS[2]	$2.5 million to $20 million	120	180 machines in 14 countries	Cray is adding about 50 installations annually
	Cray-2 line	1.9 GFLOPS				
Honeywell-NEC Supercomputers	SX2-100	330 MFLOPS[3]	$8 million to $20 million	1 at the Houston Area Research Center (HARC)	9 (8 NEC supercomputers in Japan, plus the Honeywell-NEC machine at HARC)	Honeywell-NEC expects two or three more orders in North America during 1987; the company hopes to reach a 10% to 20% market share by the early 1990s
	SX2-200	665 MFLOPS				
	SX2-400	1.3 GFLOPS				
ETA Systems	ETA-10 D Model	1.4 GFLOPS[4]	$5.5 million to $22 million	1 at Florida State University	1 (the Florida State machine is ETA's only installation to date, but two systems are set to ship during the third quarter — 1 in the U.S., 1 abroad)	ETA expects to begin volume production by the end of 1988 and to turn out volumes of machines on par with Cray by 1989
	ETA-10 E Model	6.67 GFLOPS				
	ETA-10 G Model	10 GFLOPS				
Amdahl/Fujitsu	Amdahl Vector Processor Series, Models 500, 500E, 1100, 1100E, 1200, 1200E, 1400 and 1400E	1.7 GFLOPS	$3 million to $12 million	1 at GECO Geophysical Co.	44 (includes Amdahl's 1 in the U.S. and 5 in Europe, as well as Fujitsu's 23 Japanese installations and 6 in Europe through an alliance with Siemens AG)	Amdahl would like to place an additional two or three supercomputers in the U.S. this year.

[1] As of June 1987
[2] Billion floating-point operations per second
[3] Million floating-point operations per second
[4] Peak performance on the two-processor configuration in operation at Florida State University; a 3.3 GFLOPS configuration is slated to ship this quarter

CW CHART

Staying out of politics

According to Ewald, Cray tries to approach its international sales as a good world citizen, with proper respect for its own and foreign governments. Beyond that, the company says it attempts to just concentrate on computing. "We try to keep the sales process and our business apolitical," Ewald says. "We're basically providing solutions to problems of science and engineering and mathematical modelling." When politics do interfere, as with the Indian deal, Cray tries to keep its frustrations in check.

Japan's closed markets cause the company far greater anguish, especially since some of Cray's chief competitors — NEC Corp., Hitachi and Fujitsu — hold such a strong home-court advantage.

Ewald asks, for example, how it can be that Cray has installed more than 100 processors in the U.S. but only seven in Japan, which, after the U.S., boasts the second largest gross national product of any country in the non-Communist world. Right now, about 50 supercomputers of various makes are installed throughout Japan, and most observers say there is room for at least that many more.

American companies have historically been shut out of Japanese contract bids because they either receive no notification of requests for proposals or receive it too late to do any good.

Cray does, however, see a reason for optimism in the international attention currently being focused on Japan's trade practices, Ewald says. "The world is looking at the Japanese marketplace and saying, 'Japan, you can't just export things. If you're going to play in the world, you have to import more.' "

On the flip side of Japanese trade, Ewald claims some of Cray's Japanese competitors are infiltrating world supercomputer markets through the less-than-admirable practice of price gouging — dumping supercomputers as they once dumped chips. By offering extreme discounts to potential users, Ewald says, the Japanese firms plant their machines in strategic markets such as automotive manufacturing and university research.

Some industry observers point out that by discounting machines, Japanese vendors can start building up software libraries for their supercomputers, thereby diminishing Cray's applications advantage. While Cray feels secure on the software side, Ewald says, it fears the larger possibilities.

"What I am concerned with is the economic impact that dumping has on a company like ours. . . . If you have deep enough pockets, you can put anybody out of business," he says.

The Japanese companies and their American marketing departments firmly deny all charges of wrongdoing.

HNSX: A chief challenger

HNSX in Burlington, Mass., is a 50-50 joint venture that Japan's NEC formed with Honeywell, Inc. to sell NEC machines in the U.S. The company heard dumping charges galore when it won a contract a year and a half ago for an American university supercomputing project. Newspaper reports claimed HNSX unloaded a $22 million machine for a mere $9 million under the guise of a lease at the Houston Area Research Center (HARC), a university consortium based in The Woodlands, Texas.

But James R. Berrett, chairman and

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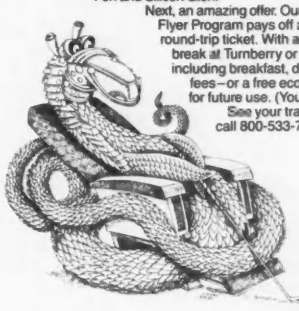

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chief executive officer of HNSX, dismisses the charges as utter nonsense, adding that the U.S. government, in an informal look at the HARC situation, found no grounds for competitors' allegations.

Canin at Hambrecht & Quist and Smaby at Piper Jaffray consider HNSX a strong competitor of Cray's, for three reasons:

- The company holds an undeniable edge in single-processor performance, with the 1.3-GFLOPS SX2-400.
- The marketing agreement with Honeywell offers access to the huge U.S. market. The arrangement includes provisions for government sales through Honeywell's government systems subsidiary, Honeywell Federal Systems, Inc.
- With the HARC installation last summer, HNSX gained a beachhead in North America.

Chairman Berrett says the company plans to move slowly at first in the U.S. market, spending a few years establishing a reputation. However, in two to three years, when HNSX unveils its next-generation machines, the firm expects to make a strong impression — 10% to 20% of U.S. supercomputer sales. Berrett says the new line will surpass both the Y-MP and Cray-3 lines.

Until the announcement of the new product line, HNSX says it will make various enhancements to its SX2 line, although these will not represent any significant change in direction, according to the firm. The company does plan to beta-test a Unix operating system in the next six months.

Convincing Uncle Sam

About the only major obstacle that lies in HNSX's way is the national origin of the machines it sells. U.S. government contracts account for about half of all supercomputer sales in the U.S., and it's tough to convince Uncle Sam to choose a foreign machine over one made in the U.S.A.

Japanese vendors' exclusion from U.S. government contracts and from contracts in the government-related aerospace industry prevents their widespread success, Smaby says. Although the federal shutout will not prevent HNSX and its kin from making some sort of dent in the U.S. market, it will prevent these companies from making a very large dent.

"The government market is the cream. That's the market Cray relies on year after year," Smaby says. "Not being able to count on that class of customer puts a company at a distinct disadvantage."

Canin agrees, but only to a point. He says that with the growth of corporate supercomputing and the volume of purchases that are currently coming out of universities, HNSX should be able to find more than enough prospects to court.

Before the firm can succeed in any U.S. market — government, university or commercial — it will need to overcome some strong protectionist tendencies, according to Berrett. "That problem's going to take some time," he says.

The company is perfectly willing to wait out any storms, though. Berrett says he is sure the bad feelings will disappear after HNSX makes its mark as a serious, aboveboard competitor.

Homegrown competition

Another competitor Cray knows it will need to reckon with is ETA in St. Paul, Minn., a subsidiary of Control Data Corp. "[ETA] and CDC are a well-respected company," Ewald says.

Currently, a two-processor version with performance comparable to that of Cray's high-end X-MPs runs at Florida State University in Tallahassee, according to Carl Ledbetter, ETA's vice-president of operations. It is ETA's only installation in the field. In this quarter, ETA plans to ship four-processor, 10.5-nsec, 3.3-GFLOPS models to three customers, including Florida State. By year's end, the firm will show an eight-processor, 7-nsec, 10-GFLOPS version, Ledbetter says.

Production models of the 10-GFLOPS machine are slated to ship in mid-1988 — about the same time Cray plans to demonstrate comparable models in-house. Canin says the timing of the offerings will put the two vendors in close competition.

ETA had originally hoped to

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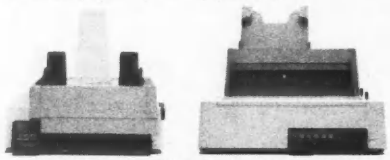

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ship its first complete 10-GFLOPS machine by the end of 1986, giving it a full year and a half to outmuscle Cray in the high-performance market before the Y-MP hit the scene. But with hardware and software problems delaying shipments, ETA can claim only parity with, not superiority to, Cray. Given Cray's brand name recognition and impressive software library, ETA will actually start the race a few lengths behind.

Still, most observers expect ETA to fare well in the long run, based on a number of factors:

- The firm's advanced technology seems promising and should support a full generation of competitive machines.
- ETA is further along in its development of a Unix operating system than most supercomputer vendors, with a beta-test of its System V operating system set for the first quarter of next year.
- ETA's relationship with CDC gives it marketing strength, and the installed base of about 40 CDC Cyber 205 supercomputers, which are upwardly compatible with the ETA-10, provides a cornerstone on which to build.
- The U.S. government seems likely to support ETA through federal contracts and grants to users such as Florida State University.

Catching up

To improve its chances, ETA is currently pushing ahead in software development, the one area in which it acknowledges inferiority to Cray. "We're moving very aggressively on the application side," Ledbetter says. "It's an obvious place where Cray has an advantage over us."

Whereas some 500 software packages have been written for Cray machines, only 105 have been written for the CDC/ETA environment. To make up lost ground, ETA recently signed contracts with 39 third-party software vendors.

So far, ETA has landed only five supercomputer contracts: the Florida State installation and orders from the National Aero-

ETA IS pushing ahead in software development, the one area in which it acknowledges inferiority to Cray.

nautics and Space Administration, Princeton University, the University of Minnesota and West Germany's national weather bureau. The company expects to sign about five additional accounts this year.

By 1989 the company plans to turn a profit, Ledbetter says, and match the volume of Cray's annual shipments, which are currently in the 50-machine range. ETA's ability to mass-produce supercomputers, made possible by an advanced manufacturing capability, could turn out to be a strong competitive advantage, according to Smaby. By mid-1988, full-volume production is scheduled to begin.

Dedication to a wide product range may also indicate a movement toward integrating the ETA-10 with CDC's product line and bringing ETA further under CDC's wing.

At a press conference scheduled for this Thursday, ETA is scheduled to announce significant improvements in price/performance and is likely to release an air-cooled version of the ETA-10, Canin says. The machine, code-named Piper, is expected to target an untapped market niche above the current crop of minisupercomputers and below the standard high-end machines like Cray's.

Such a machine would be well positioned, Smaby says, if it were priced between $1.5 million and $3 million.

Ledbetter acknowledges that ETA runs some Piper models for its own software development. The machines, which the firm configures in single-processor and multiprocessor versions, run about half as fast as their liquid nitrogen-cooled brethren.

A force from abroad

Fujitsu supercomputers hold the kind of market edge in Japan that Cray machines hold here. Fujitsu's 33 Japanese installations account for about half the total

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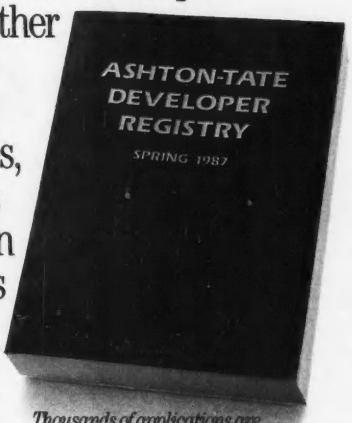

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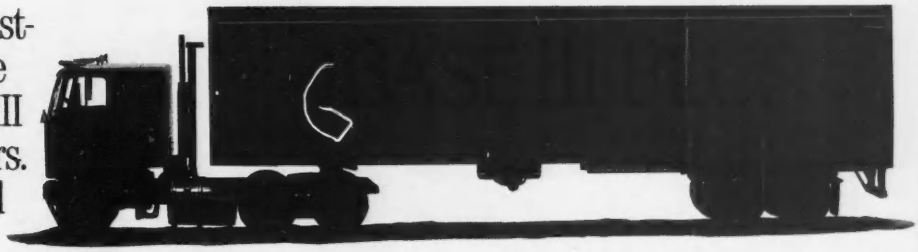

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installations in that country. But for Amdahl, which markets the Fujitsu machines in North America, gaining a foothold in the U.S. has been like pulling teeth.

Phil Howell, Amdahl's manager of vector processor marketing, attributes the difficulty to U.S. companies' reluctance to buy Japanese supercomputers. "We've had a lot of people tell us, 'We don't want to be the first,' " Howell says.

On Aug. 5, Amdahl announced its first U.S. supercomputer contract, which calls for the firm to install a mid-range Amdahl 1100 Vector Processor at GECO Geophysical Co. in Houston. The 1100 is a Fujitsu machine outfitted with IBM's MVS/XA operating system, as are all the supercomputers Amdahl markets in North America.

Important icebreaker

Canin downplays the significance of the GECO contract, pointing out that it merely extends one of Amdahl's existing European accounts. Amdahl, however, sees the installation as an important icebreaker.

The extension of GECO's European contract also serves as a strong endorsement of Amdahl's technical competitiveness, Howell says. "A single company that buys three supercomputers from you says you must be doing something right."

Amdahl supercomputers support a peak performance of 1.7 GFLOPS. Howell says the company plans to lure U.S. buyers by emphasizing its machines' high performance ratings, strong IBM compatibility and relatively low price.

Amdahl's Model 1400E, the firm's recently announced 1.7-GFLOPS machine, sells for $6.5 million with a basic 64M-byte complement of memory and for $12 million with a full 1G byte of memory. The Amdahl machines cost millions of dollars less than the high-end Crays with which they are designed to compete.

Howell says Amdahl can offer the low price mainly because Fujitsu vector processing supercomputers were designed around the same basic hardware technology as Fujitsu scalar mainframes and use some of the same mass-produced subcomponents.

Amdahl sees IBM compatibility as an equally attractive incentive for users to buy its machines. With the MVS/XA operating system, Amdahl supercomputers provide data and program-language compatibility for IBM 370 shops.

Users' programs that have not been optimized for vector processing may not show tremendous leaps in speed when they cross over from a scalar processing IBM mainframe to a vector processing Amdahl supercomputer, Howell says, but they will run unaltered. From this angle, Amdahl claims about 600 applications — the entire MVS software library — for its supercomputers. The number of applications optimized for vector processing, however, is less than 50 right now, about one-tenth of what Cray supports.

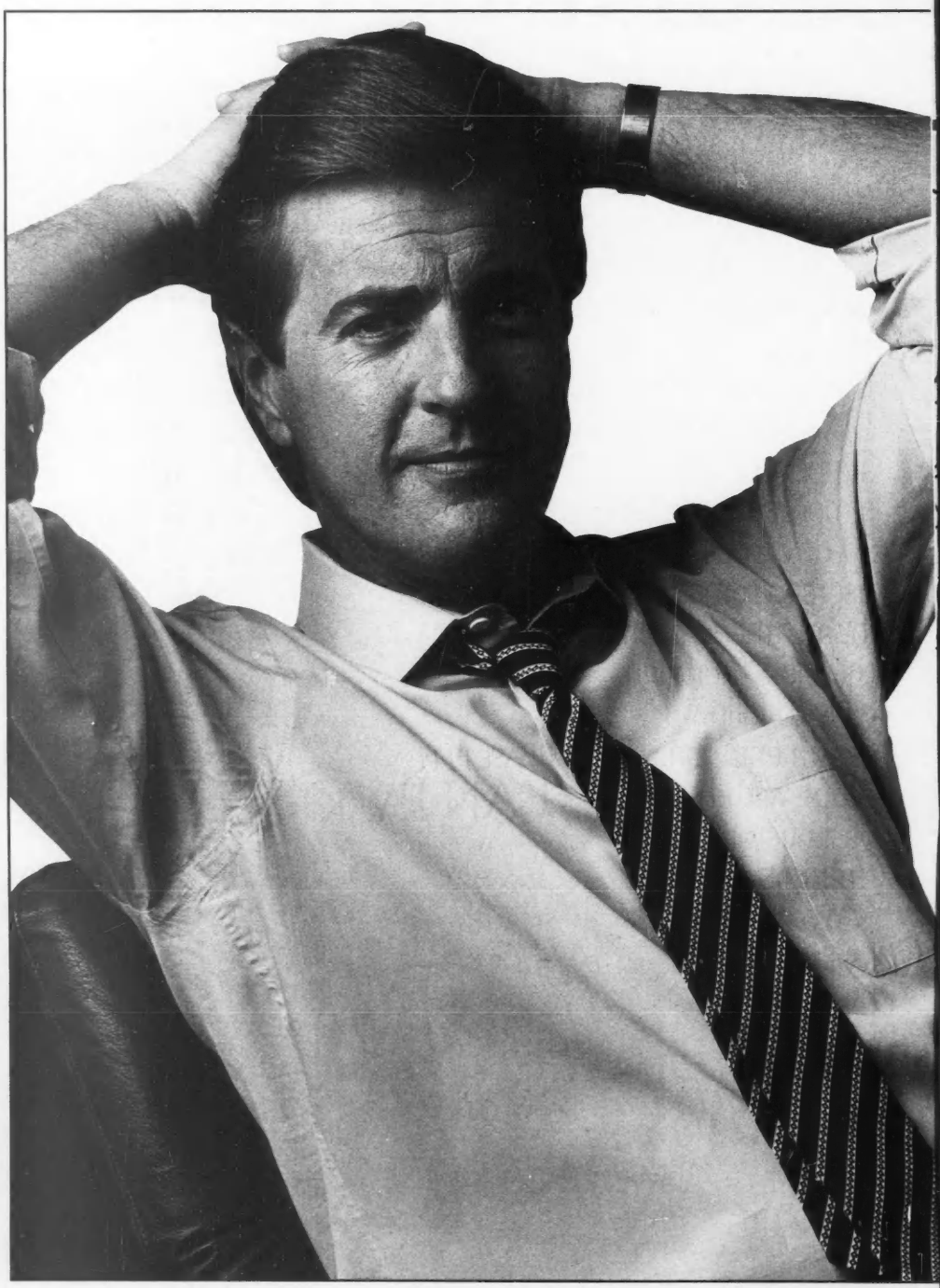
Focus misguided?

Canin says Amdahl's focus on IBM compatibility seems misguided, since users aren't biting. "The market tends to be correct," he says, and IBM compatibility "just doesn't seem to have hit a nerve with customers."

Cray's Ewald says his company views Amdahl more as a threat to IBM's high-end sales than as a challenge to its own future business, since most of Amdahl's sales come at supercomputing's entry level. But Howell insists that Amdahl will remain in the running at the high end as well, reaching the 10 GFLOPS stage right when Cray and competing vendors do.

Ewald also points out what he reads as Amdahl's recognition of its place in the market. Whereas Cray sales representatives once ran into Amdahl representatives in most European bids, the Amdahl sales force seems to have disappeared from all but heavy IBM accounts, Ewald says.

"When you stop hitting yourself over the head with a hammer, it feels better," Howell says, admitting a new focus in his company's sales efforts. But Cray and other high-end supercomputer vendors should not count Amdahl out altogether, he says. "We're trying to be wiser about where we fire our shots." ■



Big business explores supercomputer territory

Aerospace and petroleum firms, with their intensive modeling and data analysis needs, continue to purchase more supercomputers than companies from any other business sector.

Of the 180 Cray Research, Inc. machines installed worldwide, more than 60 are installed at commercial sites; of these, 55 to 57 are installed in aerospace and petroleum companies. But for supercomputer vendors, aerospace and petroleum are no longer the only games in town.

Automobile makers account for a measurable number of supercomputer sales — about 2% of the installed base. General Motors Corp., Ford Motor Co., Chrysler Corp., Honda Motor Co. and Nissan Motor Co. are among the auto makers worldwide that rely on the machines for structural and crash analyses, wind tunnel simulation and similar design tasks.

Electronics firms, with circuit and printed-circuit board designs and system simulation needs, make up a similarly sized share of the market.

Businesses in other commercial sectors are starting to take a serious look at supercomputer power, as well. Companies in three areas — chemicals and pharmaceuticals, finance and transportation planning — should be part of the next wave.

In the chemical and pharmaceuticals industries, Du Pont Co. has taken the plunge. The firm purchased its first supercomputer, a Cray-1, about 1½ years ago and says it has ordered its second, a Cray X-MP/2.

Most of Cray's high-end competitors — including Honeywell-NEC Supercomputers, Inc., ETA Systems, Inc. and Amdahl Corp./Fujitsu Ltd. — have started targeting chemicals and pharmaceuticals.

> IN THE chemical and pharmaceuticals industries, Du Pont has already taken the plunge.

Finance markets

In the financial world, Cray and the other supercomputer vendors see opportunities in the huge amount of data that needs processing and in the benefits of processing the data quickly.

"There's 24-hour-a-day, seven-day-a-week trading and a tremendous volume of information coming in. All of that has to be analyzed very rapidly," says Bob Ewald, vice-president of commercial marketing at Cray. "The company or person who can see an arbitrage opportunity more rapidly than somebody else has the potential to make a tremendous amount [of] money."

Gary P. Smaby, managing director of Piper, Jaffray & Hopwood, Inc.'s technology group, says the finance market may take a while to open up, mainly because of a software shortage. Once supercomputer vendors can develop adequate financial software — and they are hard at work at it — investment firms will likely show serious interest. Cray hopes to sign its first financial contract before the end of 1988, according to Ewald.

The third target industry, transportation planning, is not moving ahead as quickly as the other two. Smaby says airlines — the primary customer — are not yet convinced that supercomputers can generate a big enough payback in specific applications to justify their enormous expense. With the tight budgets under which the carriers operate, every move must be cost-justified, he says. "They're having trouble giving extra cups of coffee right now," Smaby says.

Still, supercomputers seem well suited to the complex logistical maneuvering required for scheduling flights, airplane maintenance and personnel. Efficient flight scheduling alone might justify the cost, Smaby says.

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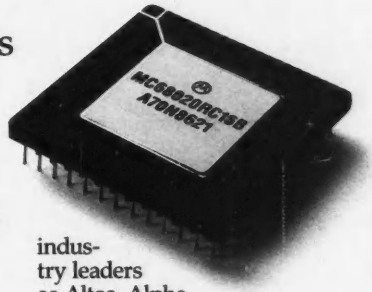

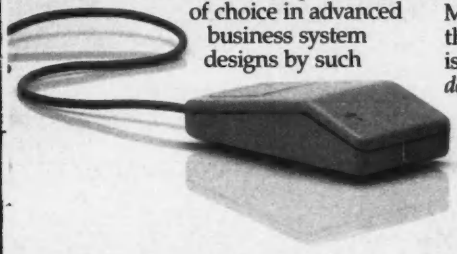

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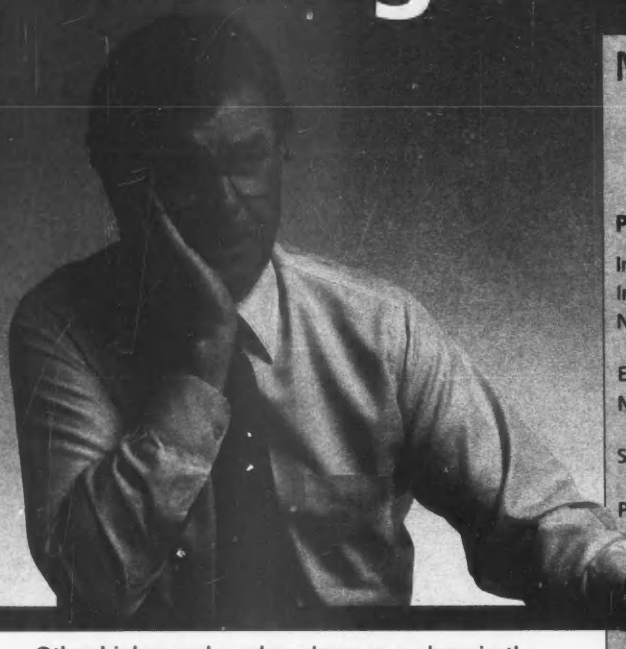

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Toward spontaneous computing

Visions of an end-user computing environment so natural you forget it's there

BY WILLIAM KIMMERLY

Increasingly, end users are assuming more direct control over computing resources and are bypassing MIS for more of their computer support needs. If we were to assume no fundamental advances in computer support during the next few years, this movement toward distributed computing might be defensible.

It is true that today's computers are relatively difficult to use and that software development takes a long time, often resulting in significant backlogs and delays. If, however, MIS could provide improved computer support with the added advantage of the end users *not* having to be consciously and explicitly involved in the process, the distributed approach would not be as defensible.

A major premise of this article is that the most effective form of computer support is one that requires the least amount of end-user time, attention and direct involvement.

In today's complex and highly competitive world, it usually takes all the time an individual can devote to a discipline or set of job functions just to maintain an adequate level of proficiency. Any additional work requirement — such as having to be directly involved with the operation, use or management of computer resources — not only reduces time available for basic job tasks but can also disrupt the fluidity of task execution necessary to perform well in a job.

Therefore, the optimal form of computer support would be natural, spontaneous and nondisruptive to the normal flow of job tasks.

This leads to the second premise of this article: the assumption that fundamental advances in computer support will occur during the next few years. I maintain that these advances will make it possible to move toward an environment I call "spontaneous computing."

This term suggests a computer support environment so natural in its access and use that most end users will require little, if any, familiarity with the technical characteristics of computers in order to use the machines effectively.

Under these ideal conditions, computer support will be more or less taken for granted. Just as telephones and television sets now attract little user attention as discrete items of technology, computers will eventually become low-profile items in most work environments, more conspicuous in their absence than in their presence.

Whether we actually reach the ideal state of spontaneous computing is not the key point. What is important is the fact that opportunities will soon exist for making major strides in that direction.

Take the challenge

In most circumstances, spontaneous computing and reduced computer involvement for the end user make a better management objective than distributed computing. This goal presents a number of challenges, not only for the computer industry but also for general managers and managers of computer support organizations.

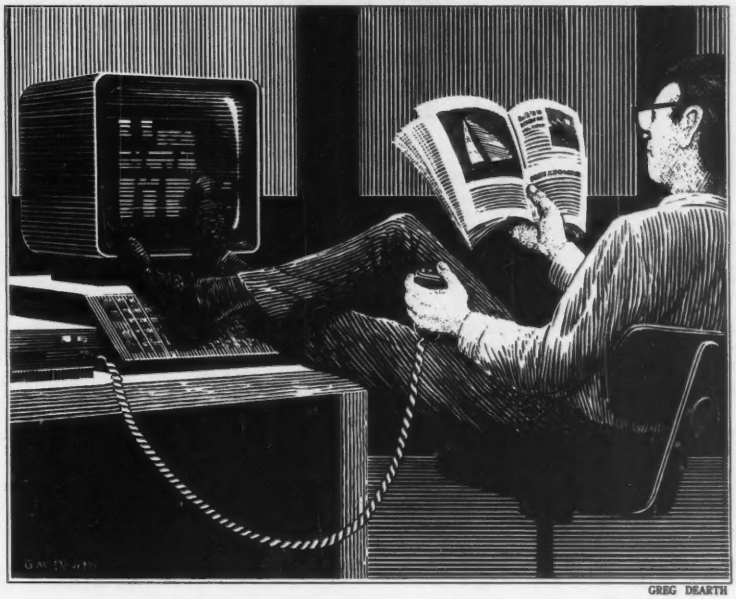
The time to address these challenges is now. Many of the areas of development that will make spontaneous computing possible are already quite familiar: microchip technology, computer architectures, communications standards, data storage systems, adaptive systems, data management techniques, software engineering tools and commercial software systems.

Some developments, such as advances in semiconductor circuits, represent long-standing trends that are continuing. The unusual strength of today's environment lies in the combination of developments and the interrelationships among these developments as they evolve. Advances in one area, such as the speed and capacity of microchips, are making advances possible in other areas, such as the development of adaptive or intelligent systems.

How to change

The phenomenon of spontaneous computing would make it possible to solve many of the problems that have long been associated with computer support. Three things are necessary for this to occur: timely recognition of the opportunity, a commitment to doing something about it and a strong strategy for effecting change.

The specifics of a transition strategy will vary, depending on



GREG DEARTH

- **Negligible end-user involvement**
- **Computers disrupt 'real work'**
- **Distributed computing come and gone**

Kimmerly is senior computer consultant for Martin Marietta Energy Systems, Inc. in Oak Ridge, Tenn.

the characteristics of a particular organization — its size, the diversity or complexity of its environment, its level of computer maturity and so on. Most strategies should, however, address the following areas:

- General management recognition of the opportunity.
- Reduction in the subjective influence of computers.
- Repositioning of central MIS and the development of required skills.
- Emphasis on data management.
- Improved software acquisition and development.
- Development work on adaptive interfaces.

The computer support characteristics and goals I lump under the term "spontaneous computing" are well known to computer specialists but are regarded by many as being too idealistic or too far off in the future to be concerned with right now. The challenge for general managers is to highlight these opportunities and to stress the immediacy of their implications.

Therefore, the first element of a transition strategy is to officially recognize spontaneous computing as a long-term goal of the organization and to translate this goal into policies and near-term objectives for the organization in general and central DP in particular.

End of infatuation

The next step is to deal with the subjective influence of computers. In most organizations, as well as in society as a whole, computers occupy a unique role among technology's ranks — not as a result of what they do but because of the ways people think about them and the relationships people eventually form with them.

In many organizations, computers have become more than just neutral tools to be used objectively and rationally. Today, they assume a strong subjective presence, an aesthetic that at times invites exaggerated interest, infatuation, tinkering or even emotional attachment on the part of end users. In many instances, this can lead to a decrease, rather than an increase, in productivity as people spend more time with computers (the means to an end) than in the execution of a specific task or function (the end itself).

IN MOST cases, spontaneous computing and reduced involvement for the end user make a better management objective than distributed computing.

To move an organization toward spontaneous computing, managers must reduce the subjective influence of computers. Again, for productivity's sake, one of the key goals of spontaneous computing is to make it possible for people to be supported by computers in a natural way, without their having to know much about the machine or be involved heavily in their use.

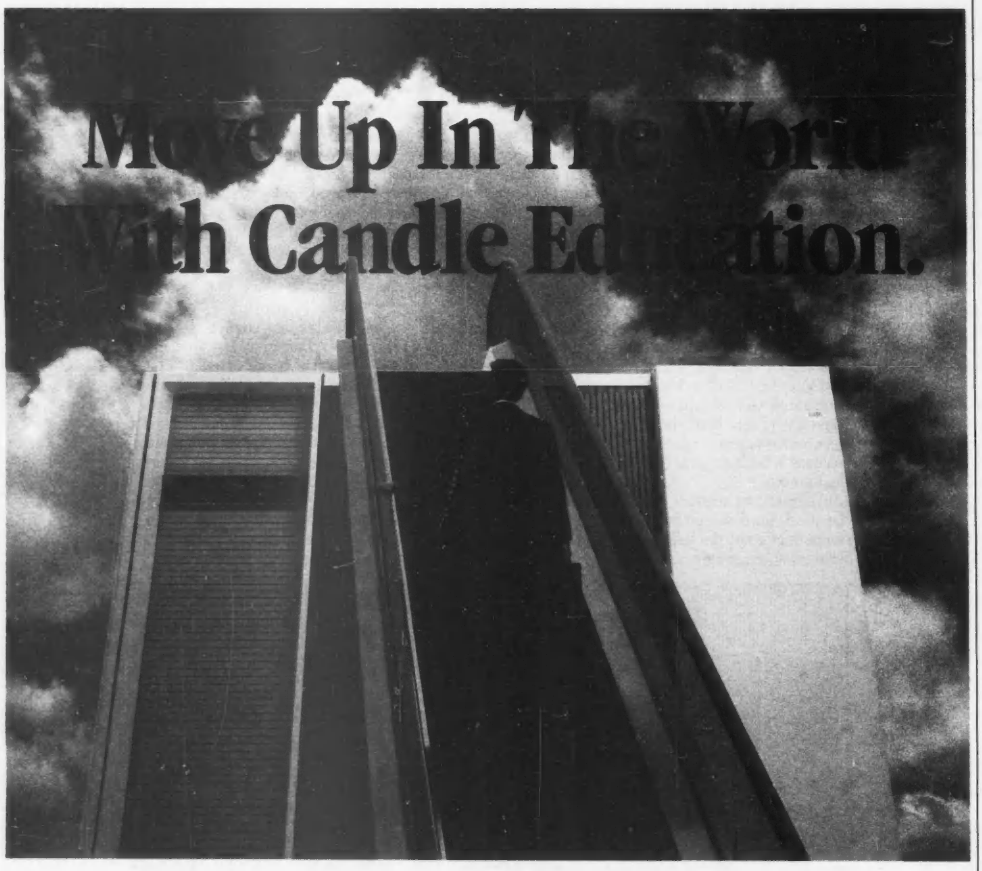
For some end users, such as research scientists or engineers, direct involvement in computers will continue to be appropriate. For the majority of users, however, the less they have to know about computers to use them effectively in their jobs, the better.

Innovation stifled?

One objection likely to be raised to this line of thinking is that if users are not directly involved with computers, innovation will suffer. Some technologists will argue that end users' experimentation has proved invaluable to the furthering of the science and its business applications.

There are two counterarguments to this objection. First, even in an era of spontaneous computing, those who have a strong interest in computers as items of technology and who want to remain deeply involved in computer programming and experimentation will be able to do so.

However, because the computer support environment will be more friendly, the analysis of opportunities and the conceptualization of new approaches will be carried out at a higher level of abstraction. Therefore, efforts



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to innovate will have more leverage.

Second, innovation is at least as likely to occur if users more fully understand the requirements of their own areas of work, instead of this level of understanding becoming diluted by excessive involvement with computers.

In the new environment, the end users will have access to skilled systems analysts who specialize in translating functional requirements into spontaneous automated support systems.

Reducing the subjective influence of computing can involve changing an important attribute of an organization's culture. While it may be difficult to alter a set of beliefs long encouraged by the examples of leaders and peer influence, change is possible.

IF THERE is a single key to spontaneous computing, it is the adaptive interface.

Central MIS repositioned

Looking at a third area of change, spontaneous computing will require a shift in emphasis on the support functions provided by central computer organizations.

There will be less emphasis on traditional programming activities and more emphasis on data management, on the integration of the data management and software development functions, on a consulting style of support and on the development of the interfaces or shells necessary to integrate systems naturally into end-user environments.

From a planning perspective, the central computer support organization will continue to play a key role in developing the overall computer, data and information systems infrastructure of the enterprise.

Developing clusters of skills that can carry out these functions takes time. Organizations that recognize these requirements and act now to develop and organize the necessary skills will be in a much better position to move toward spontaneous computing as opportunities arise to do so.

Spontaneous computing presupposes ready access to the data you need when you need it. The work required to identify, collect, structure, maintain and provide access to a well-engineered network of data bases is a field of growing technical sophistication.

This field will eventually be recognized as a distinct discipline with its own collection of accepted theories, principles and models.

Managers can identify the workers who show both an interest in and an aptitude for this area. If they are not already doing so, these workers should become familiar with current data management concepts and practices and be cultivated to grow with the discipline as it matures.

Other new skills and areas of support emphasis will also be required. One area that can be made more efficient — and would free up personnel for other assignments in the process — is the traditional applications software development and maintenance area.

In many organizations, efficiency could be improved immediately by limiting the number of software support tools to one common, integrated set and by training applications analysts in fundamental software engineering practices. Moreover, a policy of buying software whenever it is practical to do so can reduce the requirement for traditional software development activities.

Finally, the same concepts that will make computer support more natural and spontaneous

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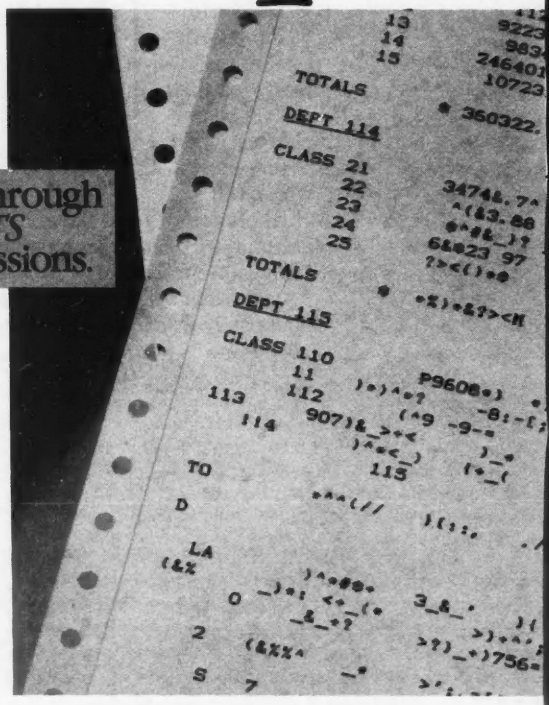

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for the end user will most likely also help the computer analyst to develop software much more efficiently.

No-sweat interfaces

Adaptive interfaces and expert systems oriented specifically toward software development have recently started to become available.

Many of these options address all phases of the software life cycle in an integrated way, improving both software development and maintenance efficiency.

If there is a single key to spontaneous computing, it is the adaptive interface, which can mask technical complexity from the user.

The design of such an interface requires a thorough understanding of the unique characteristics of the environment to be supported. Thus, these interfaces generally require significant in-house support for their development, implementation and maintenance.

Also required is an adequate understanding of the basic concepts of artificial intelligence and expert systems.

What is needed now are interfaces that give users access to systems or data without their having to specify high levels of detail.

Some like it sophisticated

For many applications, simple facilitating devices such as electronic pointing devices or touch-sensitive screens should be sufficient. For other applications, more sophisticated dialogue routines are necessary.

As an example, let's say an end user wants to retrieve a current set of data values that is located on one computer system. He then wants to perform a statistical analysis on the data using software located on another system. Finally, he wants to plot the results using plot routines located on still another system. In such a situation, the process should be facilitated by the system, and it should appear simple to the user.

If the user specifies the name of the data file and a key word description of the operation to be performed on the data — for example, "statistics," "regression" or "plot" — the interface system should lead him through the process via a straightforward dialogue routine. Further, this routine should presuppose no prior knowledge of the specific systems that have to be accessed.

THOSE OF US in these disciplines must work hard to ensure that computer support does not continue to be defined in narrow, conventional terms.

Such routines are easy to describe but difficult to build. They require skilled analysts and an effective computer planning process.

A transition strategy should include early experimental work in this area coupled with close monitoring of progress in the evolution of adaptive systems concepts and, of course, adequate training.

The means, not the end

Practitioners of computer-related disciplines will either hasten or delay the arrival of spontaneous computing, depending on the extent to which they recognize the nature and importance of this challenge and actively pursue it with a professional approach.

Those of us in these disciplines must work hard to ensure that computer support does not continue to be defined in narrow, conventional terms.

In particular, we must make it possible for the computer users to concentrate more on their basic job tasks and less on the computers that support these tasks.

General managers can play a vital role in making this happen.

Managers can demand that computer support be provided in a professional manner and make it clear that the essential criterion for success in computer support is robust support that is provided in natural, spontaneous ways. •

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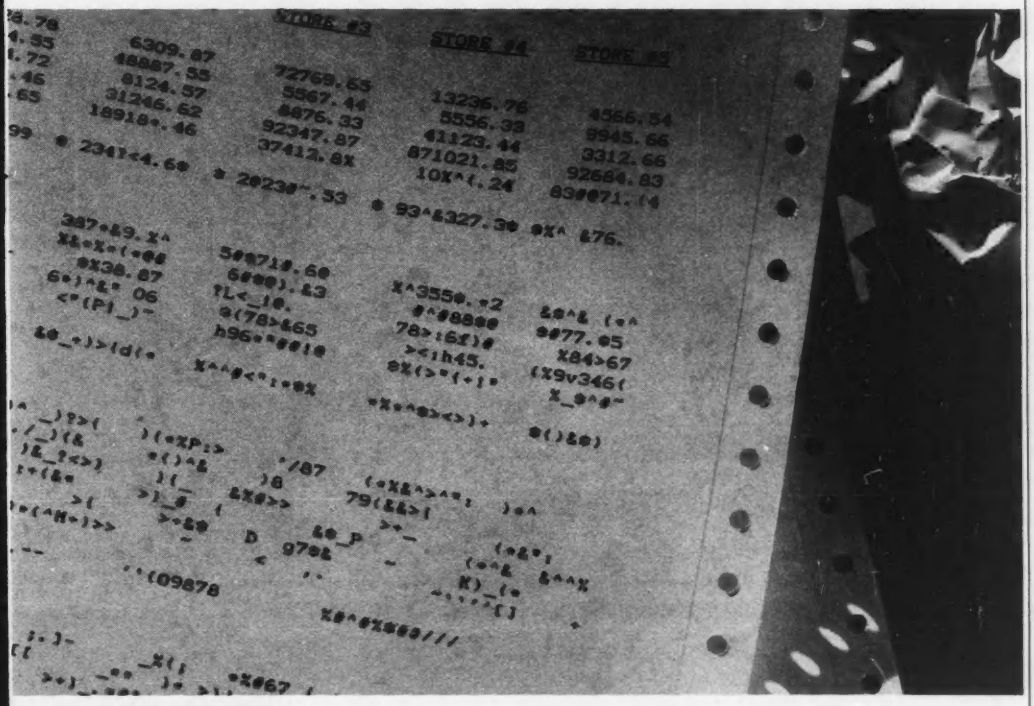

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MANAGEMENT

TAKING CHARGE

Andrall E. Pearson

Muscle-build your staff

The following article is reprinted from the Harvard Business Review.

Most top managers know they should be doing a better job of building the superior organization they want. They may not, however, know what more successful managers are doing or how to do it themselves. And while most would agree that their business' success hinges on the quality of its people, very few executives are willing to adopt the tough, aggressive approach to managing people that is required to produce a dynamic organization.

The hard truth is that only an aggressive approach can make a big difference quickly. But it has its costs. At least initially, managers have to be willing to sacrifice continuity for a thorough shake-up. Nevertheless, most top-notch companies have been through the experience; it's what transformed the company into an outstanding organization. And once the transformation has taken place, things can settle down without a loss of momentum.

In my 15 years with Pepsico and 20 years of consulting for other corporations, I have seen that "winners" — IBM, Hew-

Continued on page 121

IBM execs keep mum

Guide symposium offers support but few facts

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — A panel of top IBM executives that formed the centerpiece of a major symposium put on here by Guide International Corp. shed little new light on IBM's direction, according to user executives in attendance.

Executives complained that the panel, composed of four IBM group executives, dropped no clues regarding future product directions and instead sounded broad generalities that have already been reported.

"Probably the least interesting aspect of the conference was the IBM panel," said Ed Haas, manager of corporate information systems at Northrop Corp. "They said absolutely nothing, and they intended it that way."

However, George H. Conrades, IBM's senior vice-president and group executive of the Information Systems and Products Group, let one nugget slip in response to a user's question. Conrades said the company is willing to "deal" on System/36s and 38s.

Harvey Shrednick, vice-president of information services at Corning Glass Works, said he was gratified to hear customer responsiveness emerge as a theme from IBM. "They're talking more receptively to customers," he said. "Now we'll see if they take action. We've heard the music, let's see the dancing."

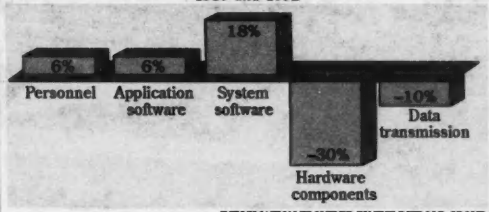
Joining Conrades on the panel were Carl J. Conti, vice-president and group executive of IBM's Information Systems and Storage Group; Terry R. Lautenbach, vice-president and group executive of its Informa-

Continued on page 120

Data View

Five-year planning

Projections of annual rates of change in unit costs between 1987 and 1992



INFORMATION PROVIDED BY THE DIEBOLD GROUP
CW CHART

Madcap stock markets rely on steadfast Leyh

BY STANLEY GIBSON
CW STAFF

With the recent scandals touching the securities industry, some cynics may think it impossible to find a good person anywhere near Wall Street.

But there is such a man, although it is necessary to look into the computer operation of the stock exchanges in order to find him. Richard E. (Dick) Leyh, executive vice-president and chief administrative officer of Securities Industry Automation Corp. (SIAC), is known by colleagues for his dependability, integrity and for being a plain nice guy.

SIAC is a Manhattan-based data processing firm that executes all of the New York and American Stock Exchanges' trades. The two exchanges created SIAC in 1972 and are its joint owners.

Easygoing

The 57-year-old Leyh's understated manner is seemingly at odds with the high-pressure world of stock trading. But while the exchanges can be described as volatile, frenetic or crazed, what they require of a computer system is consistent, unobtrusive performance. In this sense, Dick Leyh embodies what the exchanges need most to keep going.

Leyh's career in MIS started inauspiciously in 1949, when he took a job as a tabulating machine operator. But Leyh, whose easygoing manner has endeared him to colleagues, would rise steadily to play a key role in the automation of the fast-moving securities industry.

"If there's a single important standard at SIAC by which we judge ourselves, it's reliability. If I could name the single most reliable guy I know, it would be Dick Leyh," says Jim Squyres, a SIAC vice-president. "He is also a nice guy."

From SIAC's executive offices in Manhattan's financial district, Leyh outlines his current projects, which include

Continued on page 123

PROFILE
Richard Leyh

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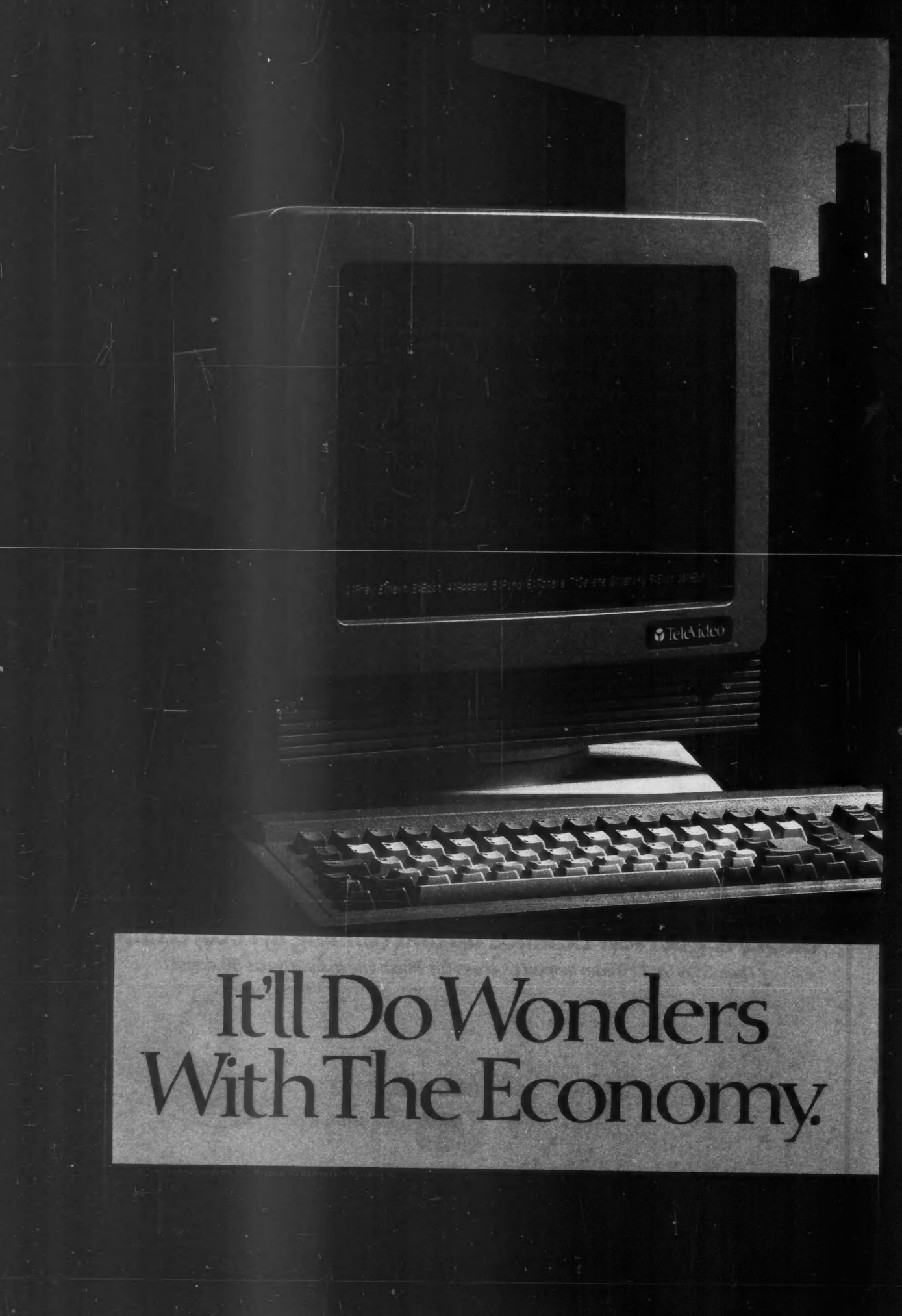

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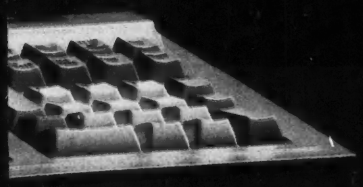

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CALENDAR

OCT. 18-24

Techskills. Cincinnati, Oct. 18-21 — Contact: American Society for Training and Development, Box 1443, 1630 Duke St., Alexandria, Va. 22313.

Eastern Prime Users Group Conference. Philadelphia, Oct. 18-21 — Contact: Michael Muraca, c/o Eastern Prime Users Group, P.O. Box 3231, Boston, Mass. 02101.

International Data Corp. Fall Executive Conference — Systems Integration: The Business Challenge. Scottsdale, Ariz., Oct. 18-21 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

Fourth Annual Nomad Users Conference. New Orleans, Oct. 18-22 — Contact: Must Software International, 187 Danbury Road, Wilton, Conn. 06897.

International Tandem Users' Group 1987 Fall Conference. New Orleans, Oct. 18-22 — Contact: ITUG, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Financial Times Annual Electronic Financial Services Conference. London, Oct. 19-20 — Contact: International Business Conferences and Seminars, Minster House, Arthur St., London, England EC4R 9AX.

Hammer Forum 87 — Strategic Information Systems: The Technological Dimension. Cambridge, Mass., Oct. 19-21 — Contact: Hammer Forum 87, Hammer and Co., 5 Cambridge Center, Cambridge, Mass. 02142.

Techconnect, The Wang Compatible Trade Show. Boston, Oct. 19-21 — Contact: Sandy Hoffman, Data Base Publications, Suite 385, 8310 Capital of Texas Highway, Austin, Texas 78731.

American Production and Inventory Control Society's 30th Annual Technical Exhibit. St. Louis, Oct. 19-22 — Contact: Stephanie Becker, APICS Technical Exhibit, P.O. Box 11480, Alexandria, Va. 22312.

CASExpo, The National Computer Aided-Software Engineering Conference and Exposition. Washington, D.C., Oct. 19-22 — Contact: Hank Bowman, CASExpo, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

The Seventh National Symposium on EDP Quality Assurance. Washington, D.C., Oct. 19-22 — Contact: U.S. Professional Development Institute, EDP Quality Assurance Conference, Suite 221, 1734 Elton Road, Silver Spring, Md. 20903.

14th Annual Conference of the North American Data General Users Group. Las Vegas, Oct. 19-22 — Contact: NADGUG, MS C-228, 4400 Computer Drive, Westboro, Mass. 01580.

Systems 87. Munich, West Germany, Oct. 19-23 — Contact: Munchener Messe- und Ausstellungsgesellschaft mbH, Messegelande Postfach 121009 D-8000 Munchen 12.

The Third Annual Expert Systems in Government Conference. Washington, D.C., Oct. 19-23 — Contact: The Computer Society of the Institute of Electrical and Electronics Engineers, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

RDB Update '87. New Orleans, Oct. 19-23 — Contact: The Relational Institute, Suite 106, 6489 Camden Ave., San Jose, Calif. 95120.

Workshop for Posix. Rockville, Md., Oct. 20-21 — Contact: Posix Workshop, Attention: Debbie Jackson, National Bureau of Standards, Room B-252, Building 225, Gaithersburg, Md. 20899.

Networld 87. Dallas, Oct. 20-22 — Contact: Networld, P.O. Box 1521, Englewood Cliffs, N.J. 07632.

Protext IV: The Fourth International Conference on Text Processing Systems. Boston, Oct. 20-22 — Contact: Paulene McKeever, Conference Management Services, P.O. Box 5, 51 Sandycove Road, Dun Laoghaire, Co. Dublin, Ireland.

Continued on page 122

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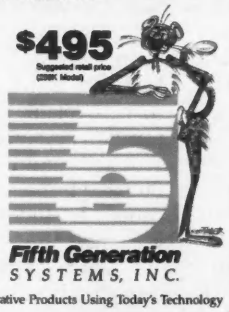

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IBM execs

CONTINUED FROM PAGE 117

tion Systems and Communications Group, and Edward Lucente, vice-president and group executive of the Information Systems Group.

In its symposium, titled Information Systems Perspective, Guide offered a lineup of speakers that included newspaper columnist George F. Will, former Nevada Sen. Paul Laxalt, Pepperdine University economist Arthur Laffer and psychologist and author Wayne Dyer.

The symposium, which ran Sept. 27-30 and drew more than 1,000 attendees, was the third put on by Guide, an association of users of large IBM systems with 2,850 members. Guide held its previous symposium four years ago.

While users were in nearly unanimous agreement that the sessions offered little in the way of technical information, they said the symposium served as a kind of support group for MIS professionals.

Frederick Smith, Federal Express Corp.'s chairman and chief executive officer, was one of a number of speakers to explain to a receptive audience the importance of investing in information systems.

"There's an awareness here that information systems is an asset and an investment," said Floyd Maxwell, MIS manager of Eastman Kodak Co.'s magnetics division in San Diego. "If I can take that message back to my general management, it will place us in a better position as a company."

But Maxwell added that his dilemma is how to accomplish that. "The fact that they were able to attract the caliber of speakers that came confirms that DP has truly affected everyone's life," he said. "But when it comes to the bottom line, we all have to answer to a corporate controller and we're placed in a position where we have to justify our expenditures."

John Hollcroft, MIS director at GTE Products Corp., said it was "refreshing" to find that Smith is a chief executive who understands the importance of technology and that it is easy to understand why Federal Express has been successful.

"We're always hearing that we should be businessmen first and technicians second," Hollcroft said. "That's because there aren't enough senior management types who understand technology. You have to wait for this generation of senior management to retire."

Muscle-build

FROM PAGE 117

lett-Packard, Marriott Corp. and Avery International, among others — emphasize "people development" as the way to "muscle-build" their organizations. By stressing the identifying and grooming of talent at every level, these companies eventually create a huge gulf between themselves and their competitors. They also hold on to most of their managers even though other firms recruit them aggressively.

What's your priority?

If you think you do a good job of managing people, try stepping back and asking yourself the following questions, which are a solid indication of whether people development is your company's No. 1 daily priority:

- Do you maintain consistent, demanding standards for everyone in your company, or are you willing to tolerate a mediocre division manager, an uneven sales force, a weak functional department head?
- What are your hiring standards? Are you bringing in people who can upgrade the quality of your company significantly, or are you just filling holes?

Are you willing to leave a vacancy open until you find an outstanding candidate — for months, if necessary?

- Are you hiring enough people? Does your organization have sufficient depth — a bank of talent to draw on — or do you sometimes promote people you know will never really produce outstanding results?
- How effective is each area of your company at identifying high-potential managers and developing them quickly?

Are promising people rotated carefully to expose them to different functions?

- Do you know specifically where your organization's biggest performance problems are? Are you taking steps to solve them, or are you looking the other way?
- Do you make measurable progress each year in the quality of your senior management group and in the people heading each functional area?

Are you generating clearly better quality executives and backups, not just people whose bosses assert that they are better managers?

Away from tradition

As the above questions suggest, traditional approaches to people development — like promotion from within based chiefly on job tenure — are no longer good enough.

A company that uses experience as its primary criterion for advancement is encouraging organizational hardening of the arteries, especially if that experience came in an undemanding environment.

Businesses today need better, brighter managers with a broader repertoire of skills; a repertoire people cannot master by working their way up a one-dimensional career ladder.

Mergers and acquisitions, new technology, price pressures and the information explosion will require a stronger and more savvy management team, people who can innovate and win in an uncertain future.

Ironically, as the need for more capable managers has heightened, the talent pool has shrunk.

More and more of the most promising future business leaders are choosing the service industries — Wall Street, consulting and smaller entrepreneurial companies — rather than moving into the big manufacturing enterprises.

These trends all call for upgrading the organization; strengthening your company's entire management group from top to bottom and attracting and preparing future leaders through new approaches — in effect, muscle-building.

For most companies, I believe that this aggressive approach is the only way to make a business live up to its potential.

Muscle-building an organization requires the following five separate but interrelated steps:

1. Set higher performance standards for everyone — and keep raising the standards. Recognize that performance can always be improved, and cultivate a spirit of constructive dissatisfaction with current performance among all executives and managers.

2. Develop managers through fresh assignments and job rotation. Keep everyone learning. Don't let high-potential people stay in the same position or the same functional area too long.

3. Adjust every facet of the work environment — corporate culture, organizational structure, policies — to facilitate and reward managers' development, rather than thwart the upgrading effort (as many formal systems do).

4. Infuse each level of the company with new talent. Bring in seasoned managers to solve organizational problems, serve as backups for management succession and lead by example.

5. Use the personnel department as an active agent for change. Make personnel executives partners in the upgrading process. Expect as much from them as from other top managers.

The commitment

The five-step upgrading process I advocate is undeniably a huge undertaking. It requires time, energy, money and possibly the restructuring of the entire company — in short, a full-court press.

A COMPANY that uses experience as its primary criterion for advancement is encouraging organizational hardening of the arteries, especially if that experience came in an undemanding environment.

You cannot achieve the results I'm talking about by implementing just one part of the process or by working to improve your organization gradually.

Nor can you hire a few MBAs or a new marketing vice-president and expect the organization to change to its roots.

A piecemeal or incremental approach will not foster the broad-based involvement, ownership and conviction that make real progress. You'll move one step forward, one step back and you'll never get off dead center. Your goal is to advance.

Some chief executive officers may feel that management muscle-building is not worth the effort it takes.

As is true with other improvement programs, the companies most in need of upgrading will probably be the ones least likely to attempt it.

Many company chiefs who have implemented a systematic people-development program, however, have told me that it became the most rewarding part of their jobs.

Muscle-building makes a difference on the bottom line, in the company's strategic success and in the way people feel when they come to work in the morning — including the CEOs.

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Pearson is a Harvard Business School professor and was president of Pepsico, Inc. and a managing director of McKinsey & Co.

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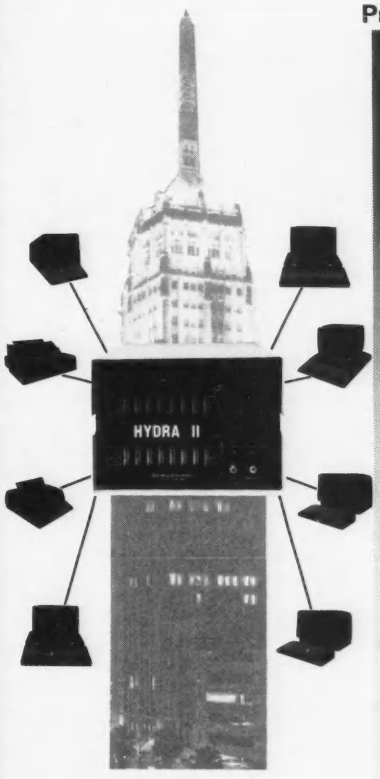

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Continued from page 120

Conference on Computers and Law. Santa Monica, Calif., Oct. 21-23 — Contact: Michael M. Krieger, P.O. Box 24619, Los Angeles, Calif. 90024.

CIM in the Process Industries. Oak Brook, Ill., Oct. 22-23 — Contact: The Yankee Group, 200 Portland St., Boston, Mass. 02114.

Independent Computer Consultants Association National Fall Conference. Stamford, Conn., Oct. 23-25 — Contact: Tretter-Gorman, Inc., 711 N. 11th St., St. Louis, Mo. 63101.

Workshop on Computer-Assisted Map Analysis. Berkeley, Calif., Oct. 24-25 — Contact: Joseph K. Berry, School of Forestry and Environmental Studies, Yale University, 205 Prospect St., New Haven, Conn. 06511.

OCT. 25-31

Annual International Conference of the IRMX Operating System User's Group. Dallas, Oct. 25-27 — Contact: Intel Corp., 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97124.

24th Joint National Meeting of The Institute of Management Sciences. St. Louis, Oct. 25-27 — Contact: The Institute of Management Sciences, 290 Westminster St., Providence, R.I. 02903.

National-American Wholesale Grocers' Association's 1987 Productivity Conference. Chicago, Oct. 25-28 — Contact: NAWGA, 201 Park Washington Court, Falls Church, Va. 22046.

Sixth Annual System 1022/1032 Users Conference. Cambridge, Mass., Oct. 25-28 — Contact: Compuserve, Data Technologies, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

International UFO-Cobol/XE User Group's Annual Conference. Orlando, Fla., Oct. 25-28 — Contact: On-Line Software International, Inc., Fort Lee Executive Drive, Fort Lee, N.J. 07024.

Operations Exchange 87. San Diego, Oct. 25-28 — Contact: , American Financial Services Association, 1101 Fourteenth St. N.W., Washington, D.C. 20005.

Microbanker Expo '87. Dallas, Oct. 25-28 — Contact: Jayne Shepro, Microbanker, Inc., P.O. Box 1508, York, Pa. 17405.

1987 Fall Joint Computer Conference. Dallas, Oct. 25-29 — Contact: The Computer Society of The Institute of Electrical and Electronics Engineers, Inc., 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

VAX Business User Forum. New York, Oct. 26-28 — Contact: IDG Conference Management Group, P.O. Box 9171, Framingham, Mass. 01701.

Corporate Electronic Publishing Systems Show and Conference. Boston, Oct. 26-28 — Contact: Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

Data Entry Management Association Conference & Equipment Exposition. Boston, Oct. 26-28 — Contact: DEMA, 750 Summer St., Stamford, Conn. 06901.

CAM-I's 16th Annual Technical Conference and Member's Meeting: Computer Integrated Enterprise. Tarpon Springs, Fla., Oct. 26-28 — Contact: CAM-I Conference Services, Suite 1107, 611 Ryan Plaza, Arlington, Texas 76011.

Fourth Annual I-DEAS Users' Conference. Cincinnati, Oct. 26-29 — Contact: Structural Dynamics Research Corp., CAE International, 2000 Eastman Drive, Milford, Ohio 45150.

The Eleventh International Fiber Optic Communications and Local Area Networks Exposition. Anaheim, Calif., Oct. 26-30 — Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

The Fourth Annual Flat Information Display Conference. San Jose, Calif., Oct. 27-28 — Contact: International Planning Information, Inc., #1, 465 Convention Way, Redwood City, Calif. 94603.

The Fifth Professional Personal Computer Conference. London, Oct. 27-28 — Contact: Financial Times Conference Organization, International Business Conferences and Seminars, 2nd Floor, 126 Jermyn St., London, England SW1Y 4UJ.

Unix Expo. New York, Oct. 27-29 — Contact: National Expositions Co., Suite 12A, 49 W. 38 St., New York, N.Y. 10018.

Educom'87. Los Angeles, Oct. 27-30 — Contact: Educom '87, P.O. Box 364, Princeton, N.J. 08540.

International Biometric Association Seminar. San Francisco, Oct. 28 — Contact: International Biometric Association, Suite 800, 1001 Connecticut Ave. N.W., Washington, D.C. 20036.

Artificial Intelligence and Advanced Computer Technology Conference and Exhibition. Atlantic City, Oct. 28-30 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

The World Conference on Electronic Printing and Publishing. Washington, D.C., Oct. 28-30 — Contact: Conference on Electronic Printing and Publishing, c/o Electronet Information Systems, Inc., 1605 King Street, Alexandria, Va. 22314.

Rothchild Consultants' TOC Conference on Optical Storage for Small Systems. Millbrae, Calif., Oct. 28-30 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

Computer Dealers and Lessors Association Joint Meeting with the European Computer Dealers and Lessors. Bermuda, Oct. 28-31 — Contact: CDLA, Inc., 1212 Potomac St. N.W., Washington, D.C. 20007.

Bureautec'87. Luxembourg, Oct. 28-29 — Contact: Societe des Foires Internationales de Luxembourg, Rue Alphonse Weicker, 2721 Luxembourg-Kirchberg, Adresse postale: L-2088 Luxembourg.

Mumps Users' Group. Washington, D.C., Oct. 29-31 — Contact: Mumps Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

Ninth Annual Computer Law Institute. Washington, D.C., Oct. 29-31 — Contact: Practicing Law Institute, 810 Seventh Ave., New York, N.Y. 10019

NOV. 1-7

Eleventh Annual Symposium on Computer Applications in Medical Care. Washington, D.C., Nov. 1-4 — Contact: Registrar, SCAMC — Office of Continuing Medical Education, The George Washington University Medical Center, 2300 K Street, N.W., Washington, D.C. 20037.

Third Annual Excelerator User Conference. Boston, Nov. 1-4 — Contact: Index Technology Group, One Main Street, Cambridge, Mass. 02142.

International Software AG Users' Conference. Miami, Nov. 1-5 — Contact: Software AG, 11800 Sunrise Valley Drive, Reston, Va. 22091.

Conference on Expert Systems Technology in the ADP Environment. Washington, D.C., Nov. 2-3 — Contact: Lloyd F. Arrowood, Program Chair, Oak Ridge National Laboratory, 4500-North, Mail Stop 207, Oak Ridge, Tenn. 37831.

The Supergroup (HP3000) Users Conference — East. Washington, D.C., Nov. 2-4 — Contact: Supergroup Association, 348 E. South Temple, Salt Lake City, Utah 84111.

Data Processing Management Association International Computer Conference and Business Exposition. San Francisco, Nov. 2-4 — Contact: DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

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Madcap

FROM PAGE 117

planning to handle an expected New York Stock Exchange (NYSE) volume of 500 million shares in one day. The current record is 302 million shares. Planning for 500 million shares trading in one day must be done now in order to assure smooth operation.

Unpredictable

In addition, Leyh points out, SIAC must stay ahead of the treacherous unpredictability of program trading. During the final minute of NYSE trading one Friday last year, 85 million shares changed hands. Three years before, that volume represented an entire day's trading.

As if just keeping the current systems running were not enough, Leyh is also coordinating the building of a second data center in Brooklyn, N.Y.

Leyh's calm assurance that those challenges can be met is founded on his considerable experience, which includes creating the first system to report stock prices as well as the first one to automatically execute trades. In the mid-1960s, while an IBM employee, he helped install the NYSE's first computer system.

Like many people in the computer business today, Leyh's IBM experience played a critical role in his development. It was there that he became interested in teaching, which he credits with giving him the necessary skills to advance in management.

"I loved teaching at IBM. It has had a long-lasting effect," Leyh says. "As you progress in management, presentation skills become very important. If everyone could teach for a year or two, it would be a good thing."

Leyh's calmness and ability to reconcile adverse forces came into play recently in smoothing the waters between SIAC and regional exchanges, according to Charles McQuade, SIAC's president and chief executive.

One of SIAC's activities is running the National Market System, which compiles trades from around the country on a single ticker. Regional exchanges such as those in Los Angeles, Chicago and Boston looked askance on SIAC's role, suspecting a subsidiary of the major exchanges — their competitors — might not act in their best interests.

"Dick had to convince them it was OK. His calmness and even-handedness conveyed a warm feeling. It assured the regional exchanges they would not be left out," McQuade says.

Leyh began at IBM in 1960, after three years at what was then Univac Corp., where he worked as a systems programmer in Newark, N.J.

Prior to that, he worked at New Jersey Natural Gas Co., where he was part of a three-man team that put in a computerized billing and audit system. His tabulating machine experience came earlier, at a New Jersey electric power company.

When IBM won the contract to computerize the NYSE, Leyh was asked to head up the development of the market data system, which reported stock prices.

Two years after the system made its debut, Leyh left IBM to join one of the two odd-lot traders on the exchange, Carlisle and Jacquelin, which later merged with another firm to form Carlisle DeCoppett.

While at Carlisle, Leyh developed the first system to automatically execute trades. In contrast, the NYSE system simply compiled trade data for output in a ticker tape format.

After SIAC acquired Carlisle, Leyh joined SIAC and helped merge the odd-lot trading into SIAC's other operations.

Now, Leyh's major responsibility is to oversee the smooth transition to a dual-data center arrangement. He built a loyal following at Carlisle, and a number of its employees followed him to SIAC, where many now hold positions of authority, according to McQuade.

Building a backup site can be seen as just another in the chain of efforts to create a stock exchange computer system that is both invisible to the user and is never interrupted by technical problems.

Leyh puts it this way: "If you are listed on the exchange, you can get in or out of shares almost on demand. The whole magic of the exchange is liquidity."

And getting in or out of shares almost on demand means 100% uptime. Leyh's modest assignment is to keep the magic going.

Wall Street review

From his office overlooking New York Harbor, Dick Leyh recounts some of the changes he has seen — and he has seen them all — from computing's earliest days, through the initial computerization of the stock exchanges in the 1960s and up to the present, when program trading and record volumes are the order of the day.

Few people today might recall that the move to computerize the stock exchanges received an important push in 1962, during the confrontation between then-President John F. Kennedy and U.S. Steel International, Inc. The threat of major strikes prompted very active trading in shares of U.S. Steel and those of firms in other affected industries.

In the fall of 1962, the New York Stock Exchange (NYSE) hit a record high of 14,750,000 shares traded in a single day. It was this heretofore unheard-of volume that prompted the stock exchanges to embark on a program of automation, Leyh recalls.

After its completion a few years later, the NYSE system joined American Airlines' Sabre system and the SAGE defense system among the first real-time on-line transaction processing systems.

A goal of the initial computerization was to retain the existing physical layout to the greatest degree posssible.

With this in view, an optical-card reader with a footprint of only one square foot had to be created for the traders, a real challenge at that time.

Leyh recalls that "in the old days," traders used to scribble out notes on paper and send the notes through pneumatic tubes to the fifth floor of the exchange, where the information was put on ticker tape. The optical-card reader supplanted the notes and tape cutters.

One part of the system had a short life span. That was a voice quotation system that translated pricing information into speech that was put onto a telephone answering system. Customers could call a number and receive the latest stock quotation verbally.

But the advent of electronic-quotation providers such as Quotron Systems, Inc. did in the phone system in short order.

Now, Leyh points out, the nation's exchanges are so linked to computers that there is no possible way that paper could ever be used again.

But, with Securities Industry Automation Corp. recording virtually 100% uptime annually, there would appear to be little need to consider alternatives.

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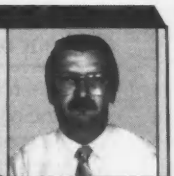

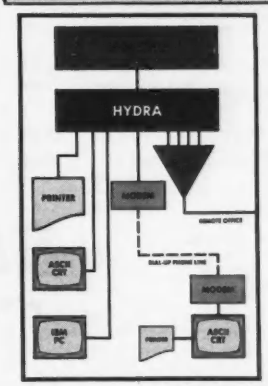

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LOCAL HAPPENINGS

NORTHEAST

Boston, Oct. 21. Data Processing Management Association, Boston Chapter. Facilitator-based Information Gathering, with Jerry Erwin of Technology Information Products Corp. Anthony's Pier 4 Restaurant. 5:30 p.m. Contact: DPMA, P.O. Box 1806, Boston, Mass. 02105.

Augusta, Maine, Oct. 21. DPMA, Maine Pine Tree Chapter. People Skills, with Sally Harwood of the University of Maine. The Senator Inn. 5 p.m. Contact: Janice Fieweger, Delta Chemicals, Inc., Searsport, Maine 04974.

Washington, D.C., Oct. 22. Black Data Processing Associates, Washington, D.C., Metropolitan Area Chapter. Tax Forum for Independent Consultants, with Connie Austin of Cadra Services, Inc. Ramada Renaissance Hotel, 1143 New Hampshire Ave. N.W. 6:30 p.m. Contact: BDPA, P.O. Box 2420, Washington, D.C. 20013.

New Cumberland, Pa., Nov. 11. Association for Systems Management (ASM), Central Pennsylvania Chapter. Artificial Intelligence, with Jack Barr of Cullinet Software, Inc., and The Oasis Message Processing System, with Jim Lightly of Pennsylvania Blue Shield.
Sheraton West. 5:30 p.m. Contact: Mark Anderson, 809 Acri Road, Mechanicsburg, Pa. 17055.

Westbrook, Maine, Nov. 18. DPMA, Maine Pine Tree Chapter. Achieving Personal Excellence, with Molly Marley. Verillo's. 5 p.m. Contact: Janice Fieweger, Delta Chemicals, Inc., Searsport, Maine. 04974.

Boston, Nov. 19. Society for Information Management, Boston Chapter. Monthly meeting. Anthony's Pier 4. Contact: SIM, P.O. Box 116, Newton Lower Falls, Mass. 02162.

Boston, Nov. 20. Society for the Management of Professional Computing, Inc. Member Panel on IC Experiences, with Ed Gaudette of Norton Co. Anthony's Pier 4. 11:45 a.m. Contact: SMPC, 715 Boylston St., Boston, Mass. 02116.

SOUTHEAST

Macon, Ga., Oct. 20. DPMA, Middle Georgia Chapter. Stress Management, with Nancy Ridley of Charter Northside. Holiday Inn, Interstate 75. Contact: L. L. Purcell, P.O. Box 4, Macon, Ga. 31202.

Lafayette, La., Oct. 22. DPMA, Acadiana Chapter. Monthly meeting. Evangeline Steak House, Highway 167 S. 6:30 p.m. Contact: Debra Billeaud, Guaranty Bank and Trust Co., Fourth Floor, 200 W. Congress St., Lafayette, La. 70502.

Myrtle Beach, S.C., Oct. 22-23. Hewlett-Packard Middle Atlantic Regional Users Group. Fall quarterly meeting: MIS and Financial Management Systems. Ocean Dunes Hotel. Contact: Stephen Day, Union Camp Corp., Box 178, Franklin, Va. 23851.

Columbia, S.C., Nov. 5. ASM, Midlands Chapter. Coping with Rapid Micro Technology Change, with David Sweatman of Companion Systems. Quality Inn, I-20 and Broad River Road. 5 p.m. Contact: George F. Hayhoe, 118 Park Ave. S.E., Aiken, S.C. 29801.

Chamblee, Ga., Nov. 10. ASM, Atlanta Chapter. Artificial Intelligence, with William Underwood of AI-Atlanta. Holiday Inn Chamblee-Dunwoody, 4386 Chamblee-Dunwoody Road. Contact: Jane Roberts, HBO & Co., 1 Ravinia Drive, Atlanta, Ga. 30346.

Charlotte, N.C., Nov. 19. ASM, Queen City Chapter. The Leader Manager, with Steven C. Slater of Wilson Learning Corp. Cosmos Steak House, 5100 E. Independence Blvd. 6 p.m. Contact: Robert Yearwood or Danny Fields, Metro Information Services, Suite 140, 7 Parkway Plaza, Charlotte, N.C. 28217.

MIDWEST

Dayton, Ohio, Oct. 20. ASM, Megacity Chapter. Computer Security and Business Concerns. Dayton Marriott, 1414 S. Patterson Blvd. 5:30 p.m. Contact: S. Beebe-Owen, Western Ohio Pizza, Inc., 2324 Stanley Ave., Dayton, Ohio 45404.

Fort Wayne, Ind., Oct. 20. ASM, Fort Wayne Chapter. A View from the Top, with Walter S. Ainsworth of Phelps Dodge and Randolph Straka of Tokheim. Goeglein's, 7311 Maysville Road. Contact: Beth Hukill, ASM, Suite 103, 10427 Leo Road, Fort Wayne, Ind. 46825.

Indianapolis, Nov. 5. ASM, Indiana Chapter. Assuring Quality in Externally Developed Systems, with Rick Naxhleanas of Eden Systems Corp. Holiday Inn Southeast, I-465 and Emerson Ave. 6 p.m. Contact: Lloyd Louks, ASM, Bank One Indiana, 450 E. Washington St., Indianapolis, Ind. 46277.

Des Moines, Iowa, Nov. 9. ASM, Des Moines Chapter. Evolving Role of DP Professionals, with Robert Rouse of Washington University. The Howard Johnson Inn, Merle Hay Road. 5 p.m. Contact: Joleen Montag, Integrated Resources Life Insurance Co., 3737 Westown Pkwy., West Des Moines, Iowa 50265.

Lafayette, Ind., Nov. 12. DPMA, Sagamore Chapter. Certification for the Computer Professional, with George Eggert. Judith Painter Catering, 101 Plaza Lane. 5:30 p.m. Contact: Joan Vaughan, MIS Department, Aluminum Co. of America, Box 7500, Lafayette, Ind. 47902.

Kalamazoo, Mich., Nov. 16. DPMA, Southwestern Michigan Chapter. Personal Communication — The Key to Success, with Hugh Brown of The Upjohn Co. The Black Swan Restaurant. 6:30 p.m. Contact: William Hoaken, Upjohn, 7171 Portage Road, Kalamazoo, Mich. 49001.

Dayton, Ohio, Nov. 17. ASM, Megacity Chapter. System Development, with Walter Moody. Dayton Marriott, 1414 S. Patterson Blvd. 5:30 p.m. Contact: S. Beebe-Owen, Western Ohio Pizza, Inc., 2324 Stanley Ave., Dayton, Ohio 45404.

Fort Wayne, Ind., Nov. 17. ASM, Fort Wayne Chapter. A View from the Top, with Robert Sanders of Phelps Dodge and Robert Kostrubanic of Tokheim. Lester's, 1502 Bluffton Road. Contact: Beth Hukill, ASM, Suite 103, 10427 Leo Road, Fort Wayne, Ind. 46825.

WEST

Portland, Ore., Oct. 19-20. Effective Software Practices: The Fifth Annual Pacific Northwest Software Quality Conference. Sheraton Inn, Airport. Contact: Lawrence & Craig, Inc., P.O. Box 40244, Portland, Ore. 97240.

Walnut Creek, Calif., Oct. 21. ASM, East Bay Chapter. Monthly meeting. Contact: ASM, 32 Robert Road, Orinda, Calif. 94563.

El Paso, Texas, Oct. 22. DPMA, El Paso Chapter. Disaster Recovery (Bosses Night). International Club, Mbank Tower. 5:30 p.m. Contact: Steve Tarro, Las Cruces, N.M.

Dallas, Oct. 21. DPMA local chapter. Quality Assurance — Prescription or Snake Oil?, with Kathleen Davis of McCormack & Dodge Corp. Infomart, Stemmons Freeway and Oak Lawn. 5:30 p.m. Contact: Ron Ritchey, DPMA, P.O. Box 2665, Dallas, Texas 75221.

San Francisco, Nov. 4. Association for Women in Computing, Bay Area Chapter. Computer Systems to Management Consulting: Making the Transition, with Gary Enersen of Enersen and White Associates. Stagecoach Restaurant, 44 Montgomery St. 5:30 p.m. Contact: AWC, Suite 1044, 41 Sutter St., San Francisco, Calif. 94104.

Oakland, Calif., Nov. 19. Golden Gate Chapter, Association for Computing Machinery, monthly meeting. El Caballo, 67 Jack London Square. 5:30 p.m. Contact: ACM, Box 26044, San Francisco, Calif. 94126.

CANADA

Guelph, Ont., Oct. 26. ASM Conestoga Chapter. Tour of OMARK, with Ken Hammil. Desert Inn. 6 p.m. Contact: Rich Clemmer, 49 Industrial Drive, W., Elmira, Ont. N3B 3B1.

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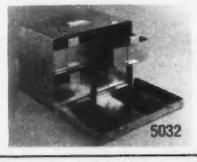
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INDUSTRY INSIGHT

Bohdan O. Szuprowicz

Real world staggers AI

At a recent conference on artificial intelligence (AI) technology and its uses, an executive in charge of AI development at a major corporation appealed to an audience of microcomputer end users to "save" the AI industry. They were asked to suggest applications that could benefit from AI technology.

Despite promotional hype and large turnouts at AI conferences, the technology is not being adopted on a significant scale into the mainstream of corporate operations.

It continues to stagnate in the backwaters of advanced technology groups and research and development departments.

Some companies never bothered to go even that far, preferring to watch the development from the sidelines.

Reluctance

A case in point is one Fortune 500 multinational firm whose chairman instructed the MIS organization to introduce AI concepts to the operating departments — hoping that managers will respond with ideas for profitable implementations.

Nothing happened. Literally nothing. Under continued pressure from the top, the MIS department queried the managers about their lack of interest. While most praised the presentations by leading AI gurus who were brought in to conduct orientation sessions, none would take the risk of implementing unproven technology in unidentified application areas.

This is the Gordian knot of AI technology today. Developed in sophisticated, nonprofit academic environments, it has been force-fed to potential end users by a combined effort of psychologists, AI tool vendors, promoters and LISP hackers who have ignored marketplace realities. Those who thought they could stampede the masses with the mumbo-jumbo of heuristic lingo failed to break the long-stand-

Continued on page 131

DEC, EMC settle patent feud

EMC to pay royalties on SBI technology use; both firms drop suits

BY STANLEY GIBSON
CW STAFF

HOPKINTON, Mass. — Resolving a chain of litigation that began two years ago, EMC Corp. said last week it has agreed to pay royalties to Digital Equipment Corp. for patent licenses covering System Backplane Interconnect (SBI) technology. As part of the agreement, both companies said they would drop pending litigation against each other.

DEC filed suit against EMC in 1985 in U.S. District Court in Boston, claiming that EMC had violated its patents on the SBI technology, which is a data path used in some DEC VAX systems, including the 11/780 and the 8600. In response, EMC sued DEC for violating federal antitrust laws.

EMC agreed to pay DEC royalty fees for past and future use of the SBI technology, which is covered in four different patents. Another patent involved in the agreement covers 11/780 memory controllers, according to DEC.

The EMC products that use the technology are memory boards and memory conversion subsystems designed for VAX 11/780 processors. There will be no price change in those products as a result of EMC's royalty payments, EMC spokesman Brian Fitzgerald said.

"DEC offered a level of payment that made it worthwhile to settle," Fitzgerald said.

'Economic, not legal'

"It was obvious to us that the suit was not a legal issue, just an economic issue," Fitzgerald added, explaining that EMC wanted to put an end to its ongoing legal expenses and save money by settling. Although Fitzgerald declined to name a specific figure for the settlement, he said the amount represents one to two months of legal fees for EMC.

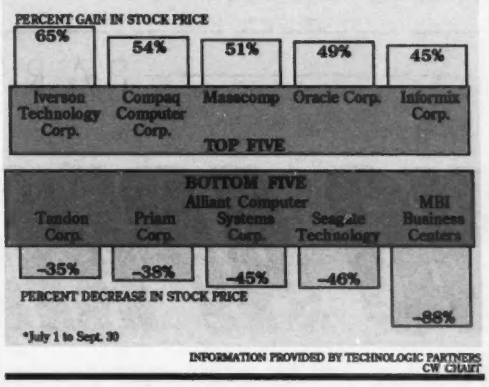
Despite the fact that EMC

Continued on page 132

Data View

Best and worst computer stocks, third quarter*

Investors were bullish on mid-range DBMSs, bearish on disk drives



INFORMATION PROVIDED BY TECHNOLOGIC PARTNERS
CW CHART

Amdahl plots to stay on top

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — With its stock experiencing an astounding 108% hike over the past year, Amdahl Corp. is seeking to maintain its record level of success by building a stronger sales force and focusing on Unix throughout its future product line.

The two-part approach was described by Amdahl President Joseph Zemke at last week's Montgomery Securities 17th Annual Investment Conference, which was held here.

Continued on page 132

DEC plans to expand OLTP push

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — While it has been selling equipment to banks and telephone companies for years, Digital Equipment Corp. said last week that it will bolster its activity in the on-line transaction processing (OLTP) market with increased enhancements to its data base management product during the next several years.

In addition, the company plans to further enhance its VMS operating system and increase relationships with third-party vendors in joint research and development.

The remarks made at the Montgomery Securities 17th Annual Investment Conference, held here, were deliberately vague as Robert Glorioso, DEC vice-president of high-performance systems, broadly outlined DEC's high-end strategy.

Continued on page 132

Inside

- Commerce, Defense Departments feud over technology export procedures. Page 130.
- Symantec buys Think Technologies. Page 130.
- Memorex International obtains a $250 million multicurrency credit line. Page 132.

CONFERENCE NOTEBOOK

Cullinet, Sun probe Unix joint development deal

BY CLINTON WILDER
CW STAFF

Exploring its first move toward the Unix environment, **Cullinet Software, Inc.** will soon begin negotiations on potential joint development with Sun Microsystems, Inc., Cullinet President George W. Tamke told investors and analysts at the annual Alex Brown & Sons, Inc. Computer Services Seminar last week in Baltimore.

The discussions will grow out of a major sales contract that Sun signed with Cullinet 11 days ago.

The contract calls for Sun's internal MIS operations to install Cullinet's manufacturing and financial applications and its IDMS/R data base management system. Cullinet won the business against Management Science America, Inc. after several months of consideration, Tamke said.

The joint development work will focus on porting Cullinet's current IBM-environment applications to Unix running on Sun workstations. It will not involve IDMS/R initially, Tamke said.

Cullinet is also negotiating potential joint development with Digital Equipment Corp., but the work with Sun is "a given," Tamke said. The two companies will work out specific terms in the next 30 to 45 days.

Computer Associates International, Inc. will eventually integrate four Uccel Corp. products into their counterparts in Computer Associates' product line through a series of upgrades. A. David Tory, senior vice-president of planning, said Computer Associates will migrate the four formerly competing products toward each other so that eventually, UCC-1 will merge with CA/Dynam, UCC-3 with CA/Dynam/DASD, UCC-7 with CA/Scheduler and ACF2 with Top Secret.

"In the next two to three releases, they will get closer together," Tory said. "We feel there's no technical reason that we can't do it — it's more a function of market conception and emotion."

In addition to the 300 Uccel employees laid off earlier this year [CW, Aug. 31], 80 others were given notice that they would be dismissed in one to three months, Tory said.

He also hinted that Computer Associates will enter the Digital Equipment Corp. VAX systems software market. "Considering our systems expertise and the 20,000 VAXs in need of systems software, there's a lot of opportunity there," Tory said.

Ashton-Tate Chairman Edward Esber predicted that Microsoft Corp.'s Excel for IBM micros (see story, page 1) will cut into Lotus Development

Continued on page 128

Computer Associates sued by investors

BY ALAN ALPER
CW STAFF

NEW YORK — Investors in a limited partnership that helped finance a product developed by Computer Associates International, Inc. have sued the company and five of its officers for allegedly depriving them of almost $1.5 million in royalties during the past five years.

According to documents filed in U.S. District Court for the Eastern District of New York, the investors claim Computer Associates and five principals — Charles Wang, Anthony Wang, Arnold Mazur, Abraham Poznanski and Peter Schwartz — engaged in two plans to deprive the partnership of royalties from its CA-Dynam/T-OS tape management system.

The investors allege that Computer Associates and its principals first altered the terms of a marketing agreement for CA-Dynam/T-OS, citing changed market conditions, for their financial gain and then either underreported or did not report product receipts.

The complaint alleged that Computer Associates "knowingly omitted more than $5 million" in CA-Dynam/T-OS license and maintenance fees during the past five years. Jeff Slade, an attorney for the limited partnership called Com-Tech Associates, said the investors were not aware of the alleged fraud committed until last spring, when they were allowed to examine Computer Associates' accounting records. Slade characterized the limited partners as passive investors who knew little of software technology and relied on the firm's officers for information.

Garden City, N.Y.-based Computer Associates has refused to respond to the investors' findings, claiming it does not have the time nor the staff, Slade said. According to the complaint, Computer Associates' Mazur is alleged to have characterized the investors' claims as "baseless" and "fantasies." Computer Associates officials did not respond to phone queries by press time.

Cullinet

FROM PAGE 127

Corp.'s spreadsheet market share. "Microsoft will be successful because [Excel] will preview their OS/2 offering and will satisfy users that are hungry for more power than they can currently get," he said.

Despite the success of Apple Computer, Inc.'s Macintosh, **Software Publishing Corp.** Chairman Fred Gibbons said his company will resist the urge to jump aboard the bandwagon.

"I'd say it's 50% harder to develop for the Mac [than for IBM PC-DOS]," he said. "It's better to stay focused. OS/2 Presentation Manager is going to be a tough nut to crack. I don't think you can do both machines well."

IBM will ship the Silverlake midrange computer shortly after announcing it in May or June 1988, according to **System Software Associates, Inc.** Chief Executive Officer Roger Covey. By 1990, Covey said he expects IBM will expand the System/36 and 38 follow-on to a power range comparable to the current 3090 Model 400, with support for 700 terminals.

Covey, whose Chicago-based firm develops applications exclusively for the System/36 and 38, predicted that IBM will evolve its manufacturing software into one product line. He said IBM will eventually replace its current mainframe offerings with the Manufacturing, Accounting and Production Information Control System to run one line in the mid-range and at the high end.

Apple software development spin-off **Claris Corp.** will maintain an arm's length relationship with its parent, said Claris CEO William Campbell, who formerly headed Apple's domestic marketing.

"We want to allow ourselves the freedom to participate with the third-party community in any application areas and markets," he said. "We will be totally separate except for that one thing called ownership." Claris expects to have its own MIS and support functions in place at its new Mountain View, Calif., location by Jan. 1.

Campbell also related a bit of current Silicon Valley humor. Noting that Claris was originally named Clarus, he said that local wags called the name an acronym for "Campbell-labeled, Apple-rejected, unsupported software."

EXECUTIVE CORNER

David M. Saykally has been named president and chief executive officer of **Unify Corp.** Before joining Unify, Saykally was president of the Answer Systems Division of Sterling Software, Inc.

The American Association of Equipment Lessors, a national trade group representing the $100 billion equipment leasing industry, recently elected a new chairman of the board. **William J. Montogomery**, president of Xerox Credit Corp. in Stamford, Conn., was named for a two-year term.

American Management Systems, Inc. has announced the appointment of **W. Brooke Tunstall** as a senior executive associate. Tunstall will serve in an advisory capacity on software market development for the professional services and software development company.

Prior to joining American Management, Tunstall was with AT&T as corporate vice-president and corporate director of divestiture planning and implementation.

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NICKELS & DIMES

Alpha Microsystems reported revenue for the second quarter, ended Aug. 23, of $11.1 million, compared with $11.6 million in the previous year. Net income was $189,000, or 6 cents per share, compared with $257,000, or 8 cents per share, in the like period a year ago.

Cypress Semiconductor Corp. announced revenue for the second quarter ended June 29 of $17 million, compared with $11 million a year ago. Profits were $3.5 million, or 9 cents per share, compared with $3.3 million, or 12 cents per share, in the like quarter a year ago.

Pyramid Technology Corp. reported revenue for the third quarter of $13.7 million, compared with $10 million in the previous year. Net income was $801,000, or 9 cents per share, compared with a loss of $2.1 million, or 27 cents per share, last year.

IPL Systems, Inc. announced revenue for the second quarter ended June 27 of $1.2 million, compared with $564,000 a year ago. Profits were $383,000, or 8 cents per share, compared with $207,000, or 4 cents per share, in the like period a year ago.

Timeplex, Inc. reported revenue for the year ended June 30 of $147.2 million, compared with $119.1 million in the previous year. Profits were $19.5 million, or $2.12 per share, compared with $9.6 million, or $1.09 per share, in the previous year.

Revenue for the fourth quarter was $40 million, compared with $30.5 million a year ago. Profits were $4.7 million, or 46 cents per share, compared with $1.2 million, or 22 cents per share, reported in the like period a year ago.

ASK reported revenue for the year ended June 30 of $98.3 million, compared with $76 million in the previous year. Profits were $8 million, or 62 cents per share, compared with $5.9 million, or 46 cents per share last year.

For the fourth quarter, revenue was $31.4 million, compared with $26.6 million a year ago. Profits were $2.6 million, or 20 cents per share, compared with $2 million, or 15 cents per share, in the corresponding period a year ago.

Priam Corp. announced revenue for the fourth quarter ended June 30 of $35.1 million, compared with $28.5 million a year ago.

The company reported a net loss of $2.8 million; or 12 cents per share, compared with a loss of $4.5 million, or 19 cents per share, in the previous year.

Revenue for the year was $129.6 million, compared with $128.8 million in the previous year. Net loss was $41.3 million, or $1.74 per share, compared with $59,000 in the like period a year ago.

The Ultimate Corp. reported revenue for the first quarter ended July 31 of $45.9 million, compared with $36.3 million last year.

Profits were $3.9 million, or 40 cents per share, compared with $2.3 million, or 25 cents per share, in the previous year.

Elxsi Ltd. reported revenue for the second quarter of $8 million, compared with $6.9 million a year ago. Net income was $266,000, compared with a net loss of $6.9 million in the previous year. The second quarter results were approximately breakeven on a per-share basis, compared with a 15-cent-per-share net loss for the second quarter of 1986.

Measurex Corp. announced net income for the third quarter ended Aug. 30 of $6.6 million, or 34 cents per share, compared with $5.3 million, or 28 cents per share, in the like period last year. Revenue was $57.7 million, compared with $49.8 million last year.

Autodesk, Inc. announced revenue for the second quarter ended July 31 of $18.8 million, compared with $12.2 million last year. Profits were $4.8 million, or 21 cents per share, compared with $2.7 million, or 13 cents per share, in the like period a year ago.

Gereral Automation, Inc. announced revenue for the fourth quarter ended June 30 of $13.1 million, with pretax income of $1.1 million and net income after application of net operating loss carryforwards of $1.3 milion, or 21 cents per share.

Total sales for fiscal 1987 were $42.8 million, an increase of more than 45% over the previous year's sales, with pretax income of $1.7 million and net income after application of net operating loss carryforwards of $1.6 million, or 33 cents per share. The fourth quarter of the previous year is not directly comparable because the quarter was shortened to two months as a result of a change in fiscal year end to June 30.

Sales for that two-month fourth quarter were $4.3 million, with net income of $6.6 million, or $1.91 per share, a result of a $10 million one-time gain resulting from a financing and restructuring of General Automation's financial position and a consequent $12 million elimination of the firm's previous bank debt and interest.

Sales for the 11-month fiscal 1986 were $29.1 million, with net income of $2.1 million, or 74 cents per share, which included the same extraordinary gain.

Alloy Computer Products, Inc. announced revenue for the second quarter ended June 30 of $12.1 million, compared with $9.2 million in the same quarter last year. Net income was $818,000, up from $212,000 in the like quarter of 1986.

SEI Corp. reported revenue for the second quarter ended June 30 of $30.3 million, roughly the same as the like quarter a year earlier. Earnings were $2.2 million, or 17 cents a share, compared with $916,000, or 7 cents a share, reported in 1986.

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NAS skirts Pentagon approval in foreign sale

BY JAMES CONNOLLY
CW STAFF

WASHINGTON, D.C. — The long-running bureaucratic struggle between the U.S. Department of Commerce and the U.S. Department of Defense for control of technology exports escalated recently amid disclosure of bids by IBM and National Advanced Systems (NAS) to sell a small mainframe to a West German company controlled by the Soviet Union.

Commerce Department officials reportedly agreed to Pentagon demands that it tighten its scrutiny of shipments of sensitive U.S. products bound for Communist-controlled firms operating in non-Communist nations.

Those reports came as several congressmen complained about the Hamburg, West Germany, firm, Transnautic Shipping Co., acquiring a NAS 8043 system to manage its business.

NAS officials reported the 8043 and accompanying disk drives were installed in July after the Commerce Department approved NAS's special export license application to sell equipment to Transnautic, which reportedly is 51% owned by the Soviet government and ships cargo to the Soviet Union. An NAS spokesman said the system remains in operation in Hamburg and that no technology was sent to the Eastern Bloc.

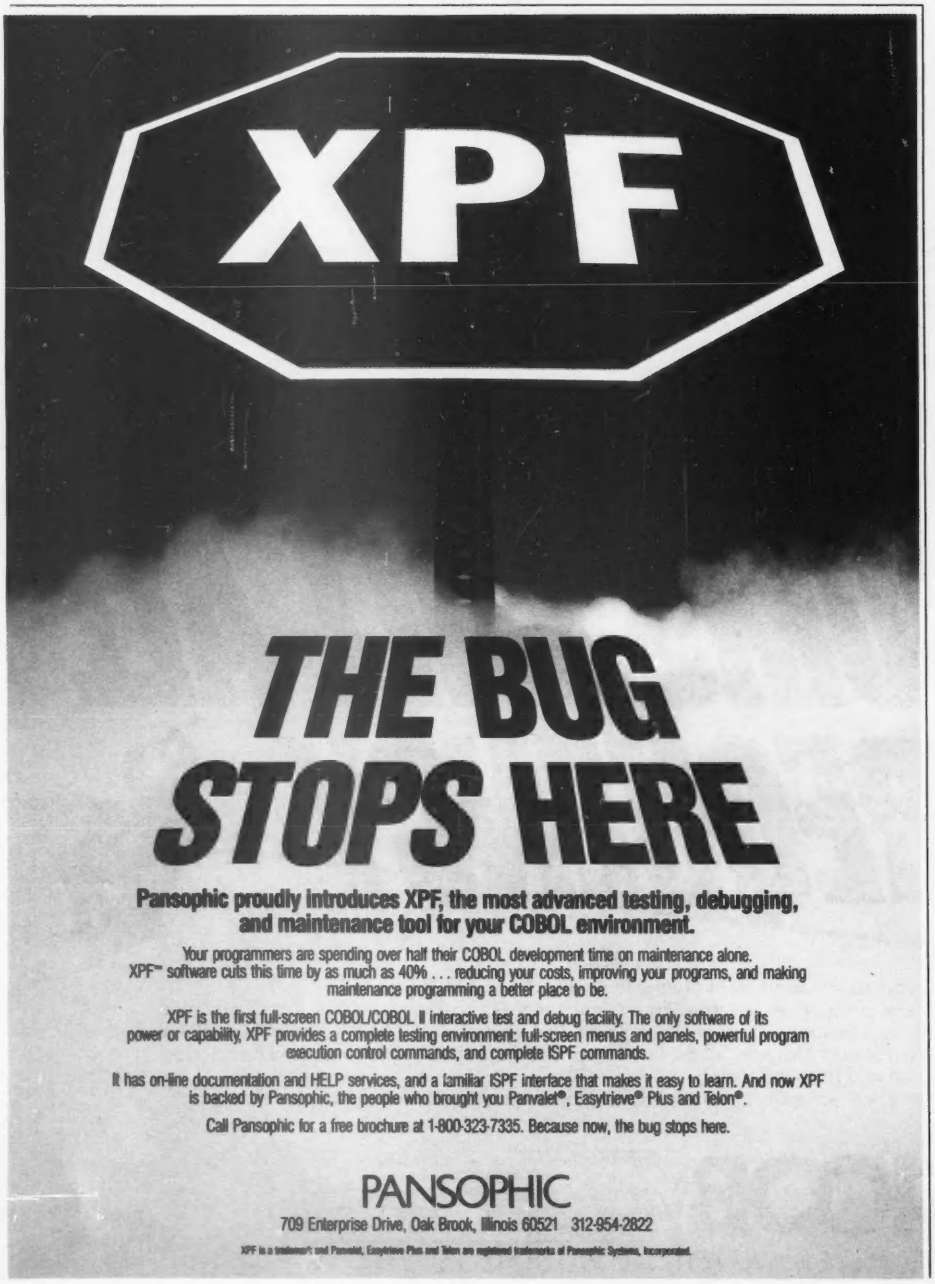
However, the NAS system was installed only after IBM applied for a similar export permit to upgrade Transnautic's existing IBM 4381.

IBM lost sale

IBM received the permit, but only after reviews of the application delayed the process so long that IBM lost the sale to NAS. IBM said it has obtained 49 licenses for exports to Transnautic but added that those licenses applied only to parts and maintenance on installed IBM equipment and what U.S. officials consider "low-tech" computers.

Commerce Department officials reportedly blamed a technical error for NAS getting its permit without Pentagon approval while IBM did not. An IBM official said IBM's name was drawn into the export dispute between the Commerce and Defense Departments only because IBM is a company that exports products. He said IBM sought the appropriate clarification and approval in the Transnautic case and that it will continue to seek such clarification when necessary.

The dispute began when legislation became effective Oct. 1, severing the Commerce Department's Office of Export Administration from the department's International Trade Administration, making the export office a separate agency.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Think swallowed by Symantec

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — IBM Personal Computer software developer Symantec Corp. recently acquired Think Technologies, Inc., a Bedford, Mass.-based company known for its programming languages for Apple Computer, Inc.'s Macintosh.

Under the agreement, representing Symantec's second alliance with a third-party Macintosh developer, Think will operate as a Symantec division, based at its current headquarters in Bedford.

Gordon Eubanks Jr., Symantec president and chief executive officer, said Think presented "an opportunity that we couldn't pass up." He said the Macintosh is a "superb platform to develop the next level of applications."

The financial arrangements of the merger were not disclosed.

Apple Chairman and CEO John Sculley gave his blessing to the union during a brief appearance at a press conference announcing the merger. "It brings together something that I had hoped would happen at this point in the PC industry," Sculley said. "We're seeing some of the best technologists in the industry coming together . . . so that they have the necessary critical mass in marketing."

"It's a pretty solid move," said William Higgs, director of software research for Infocorp, a market research firm.

Higgs said the merger brings Symantec another "niche" in the Macintosh market while avoiding competition from larger companies like Microsoft Corp. and Lotus Development Corp.

The recent Living Videotext acquisition provided an entry into the presentation graphics area, while Think will enable Symantec to move into programming languages, Higgs said. Those areas are "relatively small segments of the world," he added.

Andrew Singer, Think's founder, chairman and vice-president of product development, was appointed general manager of the Think division, reporting to Spencer Leyton, Symantec vice-president of business development and general manager of its Living Videotext division.

Think's product line includes Inbox, which is a family of desktop communications software for the Macintosh and IBM PC.

Real world

CONTINUED FROM PAGE 127

ing habits of conventional end users.

The irony of it all is that AI in general, and expert systems in particular, can offer tremendous advantages and productivity enhancement potential to the end user at the decision-making level. Unfortunately, it has been introduced and promoted predominantly by academics who have a poor understanding of the decision-making process.

They have mainly directed their efforts at middle managers who are seldom involved in strategic decision-making themselves. It is a classic case of the proverbial deaf leading the blind along a narrow mountain ridge on a dark and stormy night.

Airing the laundry

These problems came to light at a recent inaugural meeting of the Society for the Management of AI Resources and Technology — Financial Services (Smarts-F$) during a presentation on choosing and training knowledge engineers. Apparently, many candidates, who are mostly recruited from the ranks of programming types, are not necessarily enthusiastic about learning LISP or other AI skills that they perceive as much more limiting to career advancement than Cobol or DB2 capabilities.

The cost of implementing expert systems based on specialized LISP workstations also concerns management, and there is a paucity of cost-benefit studies and information to date. Moreover, applications developed in such specialized environments must be integrated or ported to end users, which automatically implies maintenance problems if an expert system is to remain effective and up-to-date.

Another criticism leveled against original promoters of expert systems is their lack of experience with large data bases and security problems, neither of which exist in academic environments.

The security problem looms much larger than in conventional software systems that primarily manipulate numbers. Knowledge bases contain actual strategies, and unauthorized access to such intelligence by competitors could seriously cripple corporate marketing plans.

As a result of all these objections, corporate strategists are treating expert systems with particular caution. Until these questions are resolved and real benefits of knowledge bases become obvious and documented, these excessively cautionary attitudes are likely to persist.

It is up to the individual and courageous end users to bring out the full potential of knowledge-based operations. Safe and immediately profitable applications, such as assessment of foreign tax credits available to a multinational corporation or diagnostic reduction of manpower, may be the first in line.

This process will accelerate when we say good-bye to the convoluted premises of the high priests of AI and come down to earth with effective knowledge-acquisition tools that the end user can understand and implement at a moment's notice.

Szuprowicz is president of 21st Century Research in North Bergen, N.J., and publisher of *Supergrowth Technology USA*.

MERGERS & ACQUISITIONS

Anacomp, Inc. announced it has sold its industrial systems division to **Electronic Data Systems Corp.** for an undisclosed price.

The industrial systems division develops and markets sophisticated purchasing support systems for large industrial users. It will become part of Electronic Data Systems' North American Commercial Group.

Symbolics, Inc. announced it has concluded and closed an agreement with **ML Technology Ventures L.P. (MLTV)**, a limited partnership sponsored by Merrill Lynch Capital Markets, to purchase MLTV's interest in a research and development joint venture established in April 1986.

The joint venture was designed to develop an advanced computer system based on implementation of a symbolic processor for use in commercial applications of artificial intelligence.

The company expects to record some portion of the purchase price as an R&D expense in the first quarter of fiscal 1988, which ended Oct. 4.

Sterling Software, Inc. said it has acquired the supercomputer business of **Zero One Systems, Inc.**, a privately held company specializing in the management and operation of advanced computer centers, including supercomputer facilities for the National Aeronautics and Space Administration and the National Science Foundation.

Zero One, headquartered in Santa Clara, Calif., has been responsible for the development and operation of the Advanced Computational Facility at the NASA/Ames Research Center since 1981 and for other computer centers for the federal government since the early 1970's.

Zero One also operates the John von Neumann Center at Princeton University in New Jersey, a major research facility funded by the National Science Foundation for a consortium of 13 universities.

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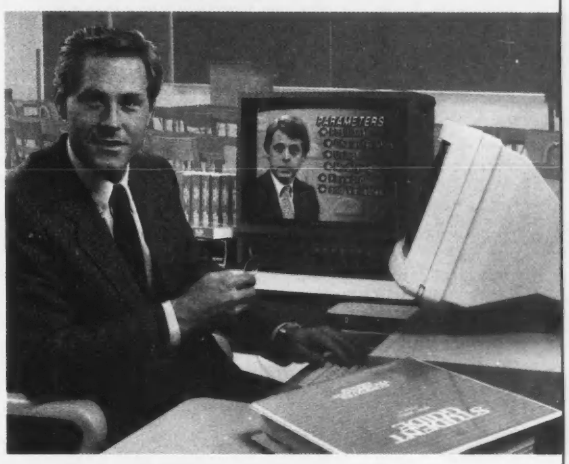

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UNIX Overview	UNIX Fundamentals for Non-Programmers*	UNIX Fundamentals for Programmers*	Shell as a Command Language*	'C' Language Programming*	Shell Programming*	Using Advanced UNIX Commands*	UNIX Internals	UNIX Administration*	Advanced 'C' Programming Workshop*	Advanced 'C' Programming Under UNIX*	Berkeley Fundamentals and 'csh' Shell*
1987 Sep 29 Nov 17	1987 Sep 30-Oct 2 Nov 18-20	1987 Oct 5-7 Nov 30-Dec 2	1987 Oct 8-9 Dec 3-4	1987 Sep 14-18 Oct 12-16 Dec 7-11	1987 Oct 19-20 Dec 14-15	1987 Oct 21-23 Dec 16-18	1987 Sep 21-24 Oct 26-29 Dec 14-17	1987 Oct 6-8 Nov 3-5	1987 Sep 28-29 Nov 9-10	1987 Sep 30-Oct 2 Sep 2-4 Nov 11-13	1987 Sep 14-18 Nov 16-18
1988 Jan 5 Feb 16 Mar 15 Apr 19 May 31 Jun 27	1988 Jan 6-8 Feb 17-19 Mar 16-18 Apr 20-22 Jun 1-3 Jun 28-30	1988 Jan 18-20 Feb 22-24 Apr 3-5 May 2-4 Jun 6-8	1988 Feb 25-26 Apr 6-7 May 5-6 Jun 9-10	1988 Jan 11-15 Feb 8-12 Mar 21-25 Apr 25-29 May 23-27	1988 Feb 1-2 Mar 7-8 Apr 11-12 May 16-17 Jun 20-21	1988 Feb 3-5 Mar 9-11 Apr 13-15 May 18-20 Jun 22-24	1988 Jan 25-29 Feb 29-Mar 3 Mar 28-31 May 9-12 Jun 13-16	1988 Jan 19-21 Feb 23-25 Mar 29-31 May 3-5 May 31-Jun 2	1988 Jan 4-5 Feb 8-9 Mar 14-15 Apr 18-19 Jun 6-7	1988 Jan 6-8 Feb 10-12 Mar 16-18 Apr 20-22 Jun 8-10	1988 Jan 11-15 Apr 25-29 May 23-27
$225	$735	$735	$490	$1225	$490	$735	$1375	$735	$490	$735	$1225
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Memorex refinances debt to tune of $225M

BY ALAN ALPER
CW STAFF

LONDON — Memorex International N.V. recently obtained a $250 million revolving credit line from 17 international banks that should enable it to finance some $225 million of debt issued to fund its leveraged buyout late last year.

The new financing will allow the former Burroughs Corp. storage subsidiary to draw up to $250 million in a number of selected currencies and will reduce Memorex's annual interest payment by around $16 million, the company said. The refinancing agreement follows the early repayment in July of $100 million of the original $550 million in debt used by the firm's European management to fund the acquisition [CW, Nov. 10, 1986].

Memorex officials attributed the early repayment to its strong cash position and inventory-management policy as well as to the working capital provided by the original financing of the buyout.

After the new credit line is put in place, Memorex's long-term debt will be reduced by $135 million. Including short-term borrowing, the overall debt reduction will be $165 million, the firm noted.

The multicurrency financing arrangement was orchestrated by Morgan Guaranty Trust Co. of New York's London office and banks in Australia, Belgium, Canada, Denmark, France, Germany, Japan, Norway, The Netherlands and the UK. The multicurrency aspect enables the firm to better manage its non-dollar cash flow and reduces exposure to foreign exchange vacillations, the company said.

The company also disclosed its first-half financial results. For the six months ended May 31, Memorex earned $45 million on revenue of almost $500 million.

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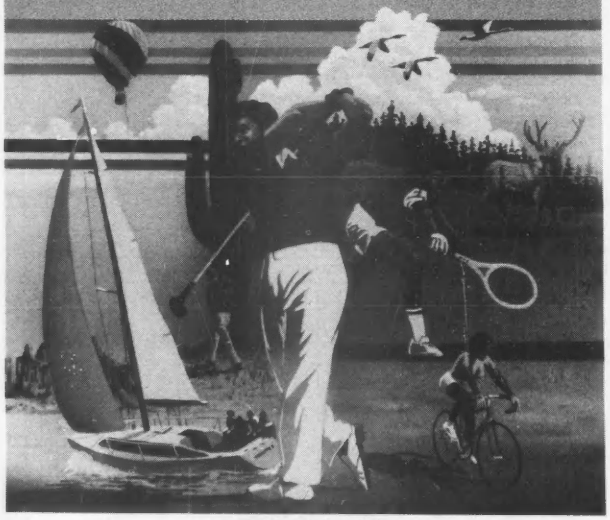

SRP
SALT RIVER PROJECT

Patent feud

CONTINUED FROM PAGE 127

agreed to pay DEC to acquire patent licenses, Fitzgerald said it is still EMC's position that it did not infringe on any of the patents in question.

He said DEC offered the settlement in order to "save face" by avoiding a court battle.

In a joint statement announcing the settlement, DEC and EMC said they will "confer in the future in an attempt to resolve potential issues between the companies."

"We feel that litigation is counterproductive," Fitzgerald said.

One possible topic of discussion could be DEC's VAXBI bus. DEC holds patents on the proprietary bus, and the company said it has been issuing licenses to use the technology to other parties on a limited basis. However, EMC has engineered its own VAXBI bus-compatible products without licensing the technology from DEC.

Both parties declined to say whether the BI bus was discussed.

OLTP push

CONTINUED FROM PAGE 127

"We have been a quiet player in this [transaction processing] market for many years," he said. "We feel that DEC equipment has a nice fit with the transaction processing arena."

During the last few months, DEC has gradually made internal changes to accommodate the transaction-processing market, Glorioso noted. It is no secret that DEC has increased appearances at banking and telecommunications shows and has hired from those industries to enhance its sales and support expertise.

While Glorioso would not disclose specifically what those other "internal" changes were, he did say that the company realized it needed to develop more of a solution for people in this market. A strong and flexible data base product, an improved VMS operating system and additional system tools will give those users a competitive edge, he claimed.

On a separate note, Glorioso said that during the next few years, DEC will increase its work with third-party developers in joint product development.

Although it is anyone's guess how agressively DEC will storm the transaction processing market, Tandem Computers, Inc., a leader in OLTP, is not worried. "Companies will have a hard time following our success," said David Rynne, Tandem's vice-president and chief financial officer. "Firms would have to redo their software and hardware to achieve what we have in data integrity, fault-tolerant features and linear performance."

Although Tandem has seen DEC salesmen coming close to its turf, DEC's foothold in Tandem's own backyard "is nothing exciting," Rynne said.

According to John Jones, a Montgomery Securities analyst, Tandem and DEC have been competing for a number of years in a market so big they have rarely bumped into each other.

Amdahl plots

CONTINUED FROM PAGE 127

During the last five years, Amdahl has shifted its position as an IBM-compatible 370 mainframe company to become a player that includes a broad spectrum of IBM-compatible storage, software and communications products. Like other vendors with IBM look-alike gear, Amdahl boasts that its lines run faster and cost significantly less.

However, Amdahl's track record shows that it is involved in a cyclical industry, Zemke admitted. For instance, the company reported net income in 1984 of $36.4 million and a year later posted a disappointing $24.3 million. The following year, net income rose to $39.4 million. Zemke intends to counter the lows in Amdahl's product life cycle through the efforts of a zealous sales team and a focus on product integrity. According to Zemke, the company increased the number of sales people this year by 25%. The challenge for the sales force in recent months has been to sell to new accounts.

"We recently sold systems to Chemical Bank, and it was the first time they bought non-IBM computers," he said. "We don't expect to take away all of a customers' IBM business, but we do want 30% to 40% of it."

The company has been involved in a quality program that scrutinizes every new product from design to manufacturing. "Our 5890 system is a direct result of the quality program," he said.

Amdahl is going to continue to offer AT&T's Unix System V on all of its computer products in order to add value to its line. Unix will represent a "significant" investment to the company in the months to come, he said.

During the meeting Zemke stressed that, despite objection from critics, the mainframe market is not softening in demand.

"I've been around a long time, long enough to know that the personal computers and workstations will not take over the market. In fact, these products will give users the opportunity to gain more access to the mainframe. Unit volumes are stronger than ever before," he said.

Contracting well drying up

A chill runs through self-employed community in wake of Section 1706

BY MICHAEL BALL
SPECIAL TO CW

Independent contracting is not what it used to be. MIS professionals considering it as an alternative to their present positions within the corporate structure must overcome restrictions to self-employment caused by Section 1706 of the Tax Reform Act.

More than any technological or economic factor, the life of independents is being altered by 1706, which took effect Jan. 1. The section states that such contractors must become, and be taxed as, employees of brokers if those brokers control a significant portion of their work.

While this change may seem innocuous, it is driving many client companies away from independents. In a recent survey of members who hire independents, the Data Processing Management Association (DPMA) found that 15% are dropping contracts for independents or intend to do so.

Jobs disappearing

"There is a wait-and-see attitude among our members and the business climate has reflected this," says Joseph E. Collins, the DPMA's governmental affairs manager. Several independents say this attitude is being quickly and dramatically noticed.

"Everyone has been affected," says Guy Scharf, an independent contractor in Mountain View, Calif. "Some consultants have gone out of business. Others haven't gotten new contracts since January."

Sheldon Goldberg, a Chicago-based independent contractor, is one of many who are finding jobs drying up in the wake of the new tax legislation. "I am starting to do different things," Goldberg says. "I market myself more to end users. I have relationships with value-added resellers and am much more heavily involved working in the micro area."

For a group that is often seen as free-thinking journeymen, being told to sign up or ship out can be quite a shock. Those hardest hit seem to be the ones who rely on brokers to market them.

Other contractors are still able to find work without involving brokers. Even with the sudden pressures from the tax legislation, New Hampshire-based independent David Weintraub remains sanguine. Since 1706 only affects third-party projects, he calls the legislation "a gadfly really, just an annoyance."

Many large firms are being alerted to the potential tax liabilities by brokers and by their own attorneys and accountants. "But there is as much work around as ever," Weintraub adds.

Some changes, though, are required to obtain the work. Self-marketing is the crux of the matter for many independents. "I've marketed myself before," Weintraub says, "and can do it again, if necessary." But selling yourself and making and maintaining the necessary connections is time-consuming.

> "EVERYONE has been affected. Some consultants have gone out of business. Others haven't gotten new contracts since January."
>
> GUY SCHARF
> INDEPENDENT CONTRACTOR

A great deal of the contractor's success depends on knowing where to look for work. For example, "Digital Equipment Corp. appears to prefer to hire contractors for some jobs," Weintraub says. "They don't add anyone to the payroll, and at the end of the project can just tell you to go away, even if they will want you for another job."

For such companies, the alternative is posting ads, interviewing candidates and finally hiring. "The purchasing department can come up with an independent contractor in hours or days," Weintraub says. "The other way, the race can be over before you have time to hire a horse to run in it."

As is typical of most independents, Weintraub once worked in the corporate environment, and he sees strong benefits on the contractor's end. "I was a vice-president, but then my kids weren't in college anymore and I decided I didn't need the aggravation," he says. "I have to buy my own health and pay my own benefits, but I structure my time when I want. When you take time off or don't work a day, you don't make any money, but I wouldn't have it any other way."

Many contractors are compensating for the loss of the big-company, mainframe contracts with microcomputer deals. "Micro work is not quite as affected by the Internal Revenue Service," Goldberg says. "They haven't gotten into that area where one or two can handle the whole project."

Many other contractors have not adapted as quickly or as well. "Some independents have opted to go ahead and become employees," Collins says. "They couldn't stand waiting to see if 1706 would be repealed and took the safe route."

The down side to that move is the difficulty of redefining a relationship later with a firm for the IRS. Employees must meet more stringent guidelines than in the past to prove they are becoming independent.

Likewise, incorporating now to sidestep 1706 may not satisfy the IRS or state tax commissions. But those who are already incorporated, and who regularly file quarterly reports and pay self-employment and Social Security taxes, are not coming under as much scrutiny as other independents. "When the state sees you pay your taxes on time, they just go away and don't bother you," Scharf says.

He says, "The incorporated, independent contractors are very safe for companies, but that does not help a contractor dealing with a local division when the corporate policy is being made elsewhere. There are companies who are running scared."

A moratorium bill on 1706 is being considered by the House Ways and Means Committee this fall. "We are hopeful that it will be put into a technical corrections bill," Collins says. "It is one small issue in that package, but it has become one of the biggest business concerns."

Ball is a free-lance writer based in Boston.

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C Developers

Systems Developer - C Compiler and Library will work on the SAS/C® compiler and library for IBM® mainframes. A bachelor's degree in computer science, mathematics, or a physical science is required. Knowledge of the C language, C library, and IBM 370 assembler language is required. In-depth knowledge of at least two of the following areas is also required: MVS or MVS/XA system, I/O and TSO interfaces, 3270 data stream, CICS, and VSAM. Experience writing software interfaces at the assembler level, working with operating systems other than MVS and MVS/XA, and working on language implementations for IBM mainframes is desired. (#215)

Compiler Writers - 370 and 8086 Family will work on generation of high-quality optimized object code by the SAS/C and Lattice® C compilers for 370 architecture mainframes (#216) or the 80x86 chips (#405). A bachelor's degree in computer science, mathematics, or a physical science is required. In-depth knowledge of 370 or 8086 object code is required. Knowledge of the C language and compiler optimization techniques is required. Experience with compiler front-ends, (#405) the 80286 or 80386, or mathematical programming in assembler is a plus. (#216, #405)

MVS

Systems Developer will develop and maintain the SAS System supervisor components for the MVS environment that interfaces to communications terminals such as IBM 3278, 3279, 3287, and 3268. Applicants must have knowledge of one or more of the following: SNA protocols, the ACF/VTAM access method, 3270 data streams, MVS/XA supervisor services, or IBM 370 assembler language. Experience with developing and supporting large software systems, VTAM/NCP service aids, the C language, and the SAS System are significant assets. A bachelor's degree in computer science or equivalent work experience is required. (#157)

Systems Developer will analyze the performance of the SAS System under MVS. Specific responsibilities include identifying performance problem areas and implementing changes. Candidates must be able to develop a comprehensive performance management program including creating test suites for performance comparisons between releases. Knowledge of data and storage management techniques and algorithms is required. Applicants must have three years' systems programming experience; technical proficiency in IBM 370 assembler and one other high-level language (C preferred); and a bachelor's degree, preferably in computer science, or equivalent experience. (#228)

Systems Developer will design and implement the cross-domain bug tracking system under MVS and develop other tools needed for porting, source management, testing and development. Applicants must have a bachelor's degree in computer science or equivalent work experience; three to five years' solid programming experience including MVS/XA, IBM 370 assembler, MVS JCL and utilities, TSO CLISTs, and ISPF/PDF. C programming experience is preferred. (#541)

Associate Systems Developer will assist in MVS implementation of a cross-domain bug tracking system for use on all host machines; develop and maintain tools for the development environment and source code management under MVS, and perform MVS implementation of portable tools to support porting code from the Apollo. Applicants must have a bachelor's degree in computer science or equivalent work experience; one to three years' of solid programming experience, preferably in the MVS environment; and experience with MVS JCL and utilities, TSO, ISPF/PDF, and IBM 370 assembler. SAS System and C experience is preferred. (#542)

CMS

Systems Developer will work on performance analysis for the SAS System under CMS. Applicants must have a bachelor's degree in computer science or equivalent work experience; a minimum of three years' programming experience; experience in VM/CMS performance or experience with large applications systems; and proficiency in IBM 370 assembler language. Knowledge of the SAS System is a plus, and knowledge of C, PL/I, and FORTRAN is helpful. (#226)

UNIX®

Systems Developer will assist in developing UNIX host code, including porting, tool writing, documenting, testing, and debugging. Applicants must have a bachelor's degree in computer science or a related field or four years' experience as a UNIX programmer. Two years' experience with the C language and the UNIX operating system is required. (#551)

VAX™

Systems Developer will develop the SAS System under VMS™. Applicants must have experience in I/O interfacing, including graphics and full-screen, disk and tape drives and devices. Requirements include a bachelor's degree in computer science or equivalent work experience, in-depth knowledge of VMS internals, RMS/QIO and data base internals, and three years' programming experience as a VMS systems programmer. (#243)

Prime

Systems Developer will port the SAS System to the Prime 50 series machine and develop machine (host) interfaces, which include memory management interfaces, I/O interfaces (disk, tape, terminal, and other devices), and interfaces to other low level operating system functions. A bachelor's degree in computer science or equivalent work experience, and in-depth knowledge of PRIMOS® internals are required. Knowledge of the C language and the SAS System is desired. (#248)

Data General

Systems Developer will port the SAS System to the Data General ECLIPSE® MV series under the AOS/VS operating system and develop machine (host) interfaces, which include memory management interfaces, I/O interfaces (disk, tape, terminal, and other devices), and interfaces to other low level operating system functions. A bachelor's degree in computer science or equivalent work experience, and in-depth knowledge of AOS/VS internals are required. Knowledge of the C language and the SAS System is desired. (#550)

PC

Associate Software Developer will develop the host supervisor for the PC DOS and OS/2 operating systems; design and develop subsystems such as task management, memory management, load management, and file I/O systems. Applicants must have a bachelor's degree in computer science or a related field or equivalent experience; one year's work experience using C programming and assembler with the Intel 8086 mirco-processor family; and the ability to debug system software at the assembler level. MS-DOS® and other micro OS experience, and a background in UNIX are preferred. (#511)

Data Base

Relational Data Base Developer will research state-of-the-art relational data base management techniques, including distributed data bases, clustering techniques, and language and interface design. A Ph.D. in computer science, or equivalent work experience is required. (#434)

Testing

SAS/IML™ Product Tester will test SAS/IML software, including evaluating test coverage and developing a test plan; developing test programs or systems; working with developers to clarify software problems and test new features and changes during the development process; and managing libraries of test programs and results. Applicants must have a bachelor's degree in mathematics with a minor in computer science or a related field, and two years' experience using the SAS System. Programming experience in APL or the C language; and familiarity with multiple operating systems such as PC DOS, VMS, and MVS are desired. (#327)

System Support

Lead VM Systems Programmer will be responsible for the Institute's VM system support effort. Duties include planning and leading the implementation of major VM hardware and software changes; maintaining and tuning vendor software products; and providing internal review for other members of the VM support staff. Applicants must have a bachelor's degree in computer science or a related field and five years' experience in VM systems support programming. Experience supervising technical professionals is highly desirable. Experience with VM/SF, computer networking, and the SAS System is a plus. (#537)

Apollo Systems Administrator will install, test, distribute, maintain, modify, tune, and diagnose systems software (AEGIS and DOMAIN/IX), as well as design and implement software tools for Apollo computers. Applicants must have a bachelor's degree in computer science or a related field, or equivalent experience. At least one year of systems administration experience is required, including ACL planning and implementation, managing Network Servers (such as NETMAIN, PRSVR, SNA Gateways) and Network Diagnostics (such as PROBENET and NETSTAT). Applicants must also have knowledge of the Apollo architecture and operating system internals. Experience with data communications hardware and software, the UNIX operating system, the SAS System, and C programming is a plus. (#533)

User Support

Technical Support Specialist, CMS Operating System will provide technical support to SAS System users under CMS; review and write draft documentation; guarantee quality of installation process, zaps, and usage notes; offer seminars on topics relating to CMS; and write support software for in-house use. Applicants must have a bachelor's degree in computer science or the equivalent, and three years' programming experience including two years' experience with the SAS System. Also required are a thorough knowledge of base SAS software, the ability to solve problems quickly and deal with simultaneous demands, and excellent verbal and written communication skills. (#377)

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This position requires a minimum of 7 years' systems development experience with a minimum of 3 years in design of on-line transaction-based systems in the areas of CICS and DL1. Application experience should include order entry, customer service and transportation/ distribution.

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A minimum of 7 years' application development experience with last 2-3 years with the MSA package as well as strong functional and technical knowledge of Payroll/HRIS functions are required.

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MVS experience with a minimum of 3 years' experience (including at least 2 years in CICS/DL1 technologies) necessary.

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10 years' large company experience required for this position. Individual will provide internal analysis, consulting, and support services necessary to maintain the company at a "state-of-the-art" with respect to mainframe and PC hardware and software entailed in decision support and office automation technologies.

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SA/P 5:0853
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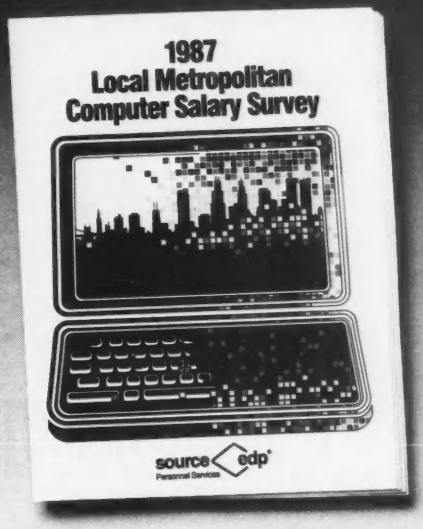

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PROGRAMMER

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SYSTEMS SOFTWARE ANALYST

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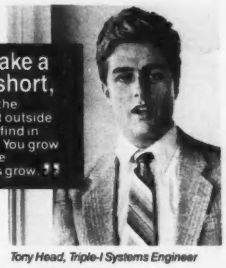
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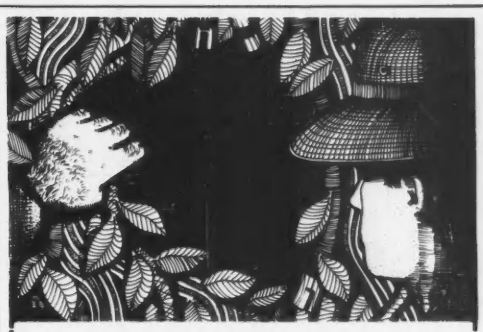

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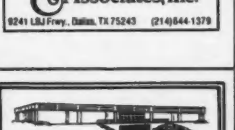
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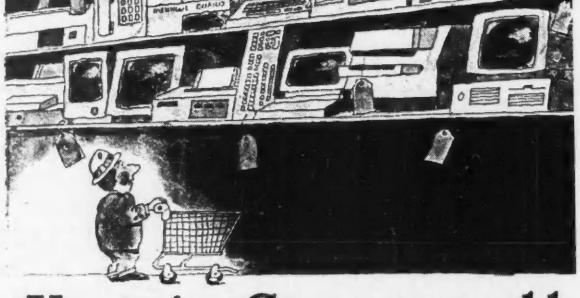

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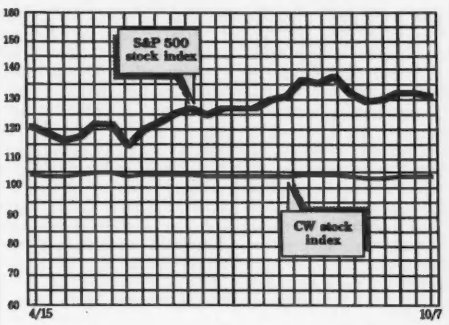

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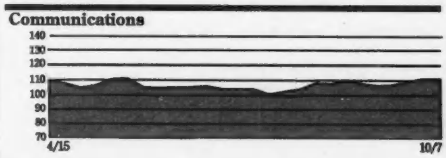

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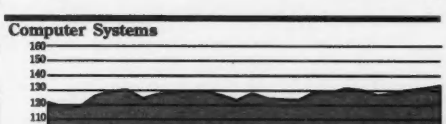

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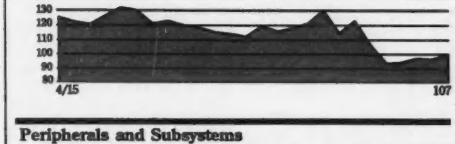

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 7, 1987

EXCH		52-WEEK RANGE (1)		PRICE CLOSE OCT. 7 1987	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	100	77	95.13	-0.3	-0.3
Q	ANDREW CORP	19	15	16.50	+0.8	+4.8
Q	ARTEL COMM CORP	5	2	2.63	-0.1	-4.5
N	AT&T	36	22	33.38	-0.4	-1.1
Q	AVANT GARDE COMP INC	6	3	5.00	-0.1	-1.2
Q	AVANTEK INC	19	13	14.38	-0.9	-5.7
N	AYDIN CORP	38	18	32.00	-2.1	-6.2
N	BELL ATLANTIC CORP	80	62	76.13	-0.5	-0.7
N	BELLSOUTH CORP	44	35	40.63	-1.5	-3.6
Q	FIBRONICS INT	11	4	4.13	-0.6	-13.2
Q	COMPRESSION LABS INC	8	4	5.63	-0.1	-2.2
O	COMPUTER NETWORK TECH	6	3	4.19	-0.3	-5.6
O	CONTEL CORP	40	27	37.00	+0.1	+0.3
Q	DATA TRANSLATION CORP	9	5	8.63	+0.8	+9.5
Q	DIGITAL COMM ASSOC	49	20	41.25	-2.5	-5.7
Q	DYNATECH CORP	44	25	26.25	+0.8	+2.9
Q	EQUATORIAL COMM CO	5	2	3.31	+0.1	+1.9
Q	GANDALF TECHNOLOGIES	11	5	7.88	+0.0	+0.0
Q	GENERAL DATACOMM INDS	14	7	7.13	+0.1	+1.8
N	GTE CORP	45	34	43.13	+1.6	+3.9
Q	INFOTRON SYS CORP	12	7	8.63	+0.9	+11.3
N	ITT CORP	66	50	62.25	+0.1	+0.2
N	M A COM INC	16	12	12.88	-0.3	-1.9
Q	MCI COMMUNICATIONS CORP	11	5	10.63	+0.1	+1.2
Q	MICOM SYS INC	18	10	12.88	+0.9	+7.3
N	NETWORK SYS CORP	19	9	11.38	+1.1	+11.0
N	NORTHERN TELECOM LTD	24	14	20.38	-1.9	-8.4
Q	NOVELL INC	30	10	27.50	+1.5	+5.8
N	NYNEX CORP	78	59	76.50	-0.3	-0.3
N	PACIFIC TELESIS GROUP	34	23	32.50	-0.1	-0.4
N	PARADYNE CORP	9	4	6.00	-1.1	-15.8
A	PENRIL CORP	6	4	4.25	+0.1	+3.0
N	PLESSEY PLC	41	24	34.50	-1.4	-3.8
N	SCIENTIFIC ATLANTA INC	20	9	15.50	-1.4	-8.1
N	SOUTHWESTERN BELL CORP	48	33	43.00	-0.9	-2.0
Q	3 COM CORP	26	11	24.63	+3.6	+17.3
N	TIMEPLEX INC	41	15	32.25	+2.9	+9.8
Q	UNGERMANN BASS INC	16	8	9.50	-0.3	-2.6
N	U S WEST INC	60	45	57.75	-1.1	-1.9

Computer Systems

Q	ALLIANT COMPUTER SYS	37	10	10.50	-4.8	-31.1
Q	ALPHA MICROSYSTEMS	7	3	4.75	-0.1	-2.6
Q	ALTOS COMPUTER SYS	17	10	14.50	+0.5	+3.6
A	AMDAHL CORP	50	19	47.50	+0.4	+0.8
Q	APOLLO COMPUTER INC	25	12	21.00	+0.5	+2.4
Q	APPLE COMPUTER INC	60	16	55.50	-1.0	-1.8
N	BOLT BERANEK & NEWMAN	30	19	23.00	+0.0	+0.0
Q	BRITTON LEE INC	5	3	4.00	+0.5	+14.3
N	COMPAQ COMPUTER CORP	79	15	75.38	+2.9	+4.0
Q	COMPUTER AUTOMATION INC	17	2	15.00	+0.5	+3.4
A	COMPUTER CONSOLES INC	12	4	5.38	+0.8	+16.2
Q	CONCURRENT COMP CORP	24	13	19.75	-1.0	-4.8
Q	CONTROL DATA CORP DEL	38	24	35.38	+0.1	+0.4
Q	CONVERGENT TECH	12	4	6.50	-0.1	-1.9
Q	CONVEX COMPUTER CORP	22	8	14.13	+0.9	+6.8
N	CRAY RESH INC	136	69	93.63	+0.8	+0.8
Q	DASY SYS CORP	13	7	9.25	+1.4	+17.5
N	DATA GEN CORP	39	25	35.38	+2.5	+7.6
N	DATAPOINT CORP	9	4	8.38	+0.1	+1.5
N	DIGITAL EQUIP CORP	200	90	191.00	+1.3	+0.7
N	FLOATING POINT SYS INC	17	8	9.38	+0.6	+7.1
N	GOULD INC	25	16	23.25	-1.0	-4.1
N	HARRIS CORP	43	28	38.38	+0.4	+1.0
N	HEWLETT PACKARD CO	74	37	69.75	-0.8	-1.1
N	HONEYWELL INC	91	58	79.88	+0.5	+0.6
N	IBM	176	116	152.75	+2.0	+1.3
Q	INFORMATION INTL INC	17	13	13.50	-0.3	-1.8
Q	IPL SYS INC	3	2	2.63	-0.1	-4.5
Q	MASS COMPUTER CORP	14	6	11.75	-0.5	-4.1
N	MATSUSHITA ELEC INDL LTD	195	93	191.00	-1.0	-0.5
Q	MEGADATA CORP	7	2	4.88	-0.1	-2.5
Q	MENTOR GRAPHICS CORP	39	14	35.25	+1.0	+2.9
N	NBI INC	14	8	11.13	-0.1	-1.1
N	NCR CORP	67	42	62.63	+0.3	+0.3
N	PRIME COMPUTER INC	31	16	25.50	+0.1	+0.5
Q	PYRAMID TECHNOLOGY	12	4	10.75	+0.8	+7.5
Q	STRATUS COMPUTER	41	18	32.50	-0.3	-0.9
Q	SUN MICROSYSTEM INC	46	14	41.00	+4.8	+13.1
Q	SYMBOLICS INC	6	4	3.63	-0.1	-1.7
N	TANDEM COMPUTERS INC	38	17	35.38	+2.1	+6.4
N	TANDY CORP	57	32	51.88	+1.6	+3.1
N	ULTIMATE CORP	37	13	33.50	-3.5	-9.5
N	UNISYS CORP	48	23	44.88	+0.3	+0.6
A	WANG LABS INC	19	11	18.50	+0.9	+5.0

Software & DP Services

Q	ADVANCED COMP TECH	6	3	5.63	+1.9	+50.0
N	ADVANCED SYS INC	29	12	26.00	-0.5	-1.9
N	AGS COMPUTERS INC	27	9	23.88	+0.4	+1.6
Q	AMERICAN MGMT SYS INC	20	7	18.88	+0.8	+4.4
Q	AMERICAN SOFTWARE INC	22	8	13.75	+0.4	+2.8
N	ANACOMP INC	11	3	10.00	-0.5	-4.8
Q	ANALYSTS INTL CORP	9	4	9.25	+1.3	+15.6
Q	ASHTON TATE	33	15	30.75	+3.3	+11.8
Q	ASK COMPUTER SYS INC	17	10	13.00	-0.5	-3.7
Q	AUTODESK INC	34	11	30.00	+2.5	+9.1
N	AUTO DATA PROCESSING	55	34	50.38	+0.3	+0.6
Q	BOOLE & BABBAGE INC	12	6	10.00	-0.3	-2.4
N	COMPUTER ASSOC INTL INC	37	11	35.38	+2.9	+8.8
Q	COMPUTER HORIZONS CORP	15	10	13.38	+1.4	+11.5
N	COMPUTER SCIENCES CORP	73	31	68.88	+0.4	+0.5
Q	COMPUTER TASK GROUP INC	18	12	15.50	+0.4	+2.5
Q	COMSHARE INC	28	11	22.00	-0.8	-3.3
N	CULLINET SOFTWARE INC	14	6	12.88	+0.4	+3.0
Q	CYCARE SYS INC	10	7	9.13	-0.3	-2.7
Q	DUQUESNE SYS INC	33	15	18.00	-0.8	-4.0
Q	ENDATA INC	16	6	15.75	-0.1	-0.8
N	GENERAL MTRS (CLS E)	51	24	47.88	-0.4	-0.8
Q	HOGAN SYS INC	17	8	8.50	-0.3	-2.9
Q	INFORMIX CORP	31	8	28.00	+1.3	+4.7
Q	INTELLICORP INC	11	4	5.50	+0.3	+4.8
Q	KEANE INC	10	5	9.38	+0.0	+0.0
Q	LOTUS DEV CORP	38	14	36.75	+3.5	+10.5
Q	MANAGEMENT SCI AMER	21	11	13.38	+0.5	+3.9
Q	MICRO PRO INTL CORP	8	2	6.31	+0.3	+4.1
Q	MICROSOFT CORP	78	15	73.00	+6.8	+10.2
Q	NATIONAL DATA CORP	28	19	26.00	-0.9	-3.0
Q	ON LINE SOFTWARE INTL INC	22	9	19.00	+0.0	+0.0
Q	ORACLE SYS CORP	38	8	33.38	+0.9	+2.7
N	PANSOPHIC SYS INC	28	12	25.25	+1.1	+4.7
Q	POLICY MGMT SYS CORP	30	18	28.25	+2.3	+8.7
Q	PROGRAMMING & SYS INC	14	8	12.88	-0.1	-1.0
Q	REYNOLDS & REYNOLDS CO	39	27	29.00	-1.5	-4.9
Q	SEI CORP	18	9	17.25	+1.0	+6.2
Q	SHARED MED SYS CORP	53	23	28.00	-0.1	-0.5
Q	SOFTWARE AG SYSTEMS INC	19	10	13.38	+1.0	+8.1
Q	SOFTWARE PUBG CORP	17	5	11.00	+1.3	+12.8
A	STERLING SOFTWARE INC	16	9	9.13	-1.4	-13.1
Q	SUNGARD DATA SYS INC	21	11	18.50	+1.3	+7.2
Q	SYSTEMATICS INC	30	14	29.25	+2.0	+7.3
N	SYS. SOFT INC.	24	14	22	+1.8	+8.8
N	URS CORP	23	13	19.75	+0.1	+0.6
Q	VM SOFTWARE INC	45	13	15.25	+0.0	+0.0

Semiconductors

N	ADV MICRO DEVICES INC	25	13	23.00	+1.0	+4.5
N	ANALOG DEVICES INC	24	14	19.00	-0.3	-1.3
Q	ANALOGIC CORP	13	10	10.25	-0.1	-1.2
Q	INTEL CORP	63	18	60.75	+3.0	+5.2
Q	LSI LOGIC CORP	17	8	14.13	+1.4	+10.8
N	MOTOROLA INC	74	34	70.25	+0.4	+0.5
N	NATL SEMICONDUCTOR	22	9	20.50	+2.1	+11.6
N	TEXAS INSTRS INC	80	35	76.38	+1.6	+2.2
A	WESTERN DIGITAL CORP	33	14	24.88	+1.3	+5.3

Peripherals

Q	ALLOY COMP	12.75	4.5	9.75	-0.3	-2.5
N	AMI INTL INC	9	5	7.50	+0.6	+8.1
Q	AST RESH INC	23	11	15.63	+0.0	+0.0
Q	AUTO TROL TECH CORP	9	3	5.88	-0.1	-2.1
Q	BANCTEC INC	16	8	12.63	-0.3	-1.9
Q	CIPHER DATA PRODS INC	18	9	9.88	-0.9	-8.1
A	COGNITRONICS CORP	5	2	4.25	+0.0	+0.0
N	COMPUGRAPHIC CORP	28	19	27.00	-0.1	-0.5
N	COMPUTERVISION CORP	23	13	15.50	+1.3	+8.8
A	DATAPRODUCTS CORP	16	10	11.13	-0.5	-4.3
A	DATARAM CORP	9	7	7.75	+0.1	+1.6
N	DECISION INDS CORP	13	7	11.25	+0.0	+0.0
N	EASTMAN KODAK CO	106	59	100.25	-1.6	-1.6
Q	E M C CORP MASS	29	9	23.25	+1.3	+5.7
Q	EMULEX CORP	10	6	7.75	-0.4	-4.8
Q	EVANS & SUTHERLAND	40	21	26.75	-0.3	-0.9
Q	ICOT CORP	13	5	6.88	+0.4	+5.8
Q	INTERLEAF INC	24	8	22.00	+2.8	+14.3
Q	IOMEGA CORP	8	2	2.88	+0.0	+0.0
Q	LEE DATA CORP	10	5	4.88	-0.4	-7.1
Q	MAGSTOR SYS CORP	6	3	3.56	-0.3	-8.1
Q	MAXTOR CORP	34	10	13.75	+0.1	+0.59
Q	MICROPOLIS CORP	44	17	31.88	+3.5	+12.3
Q	MINISCRIBE CORP	18	7	15.63	+0.0	+0.0
N	MINNESOTA MNG & MFG CO	84	50	79.38	-2.4	-2.9
A	MSI DATA CORP	24	11	22.25	-0.8	-3.3
Q	PRIAM CORP	6	2	3.00	+0.3	+9.1
Q	PRINTRONIX INC	13	10	10.63	-0.6	-5.6
N	QMS INC	27	12	25.00	+0.4	+1.5
Q	QUANTUM CORP	35	15	16.00	-0.8	-4.5
Q	RAMTEK CORP	6	4	5.75	+0.3	+4.5
N	RECOGNITION EQUIP INC	27	12	15.38	-0.4	-2.4
Q	REXON INC	14	6	7.50	-0.5	-6.3
Q	SCAN TRON CORP	17	11	12.00	-1.0	-7.7
Q	SEAGATE TECHNOLOGY	46	15	20.88	+2.5	+13.6
N	STORAGE TECH CORP	5	2	2.88	+0.0	+0.0
Q	TANDON CORP	7	3	3.38	+0.0	+0.0
A	TEC INC	7	3	5.00	-0.3	-4.8
N	TEKTRONIX INC	43	30	34.75	-0.3	-0.7
Q	TELEVIDEO SYS INC	3	2	2.63	-0.1	-2.3
N	TELEX CORP	102	46	59.00	+7.4	+14.3
Q	WYSE TECH	40	13	36.75	-0.4	-1.0
N	XEROX CORP	85	52	75.25	-3.8	-4.7
Q	XIDEX CORP	16	11	12.63	+0.3	+2.0

Leasing Companies

Q	CAPITAL ASSOC	10.6	7	8.3	+1.0	+13.7
N	COMDISCO INC	37	16	35.50	+1.5	+4.4
N	CONTINENTAL INFO SYS	14	7	9.63	-0.3	-2.5
Q	PHOENIX AMERN INC	8	3	4.50	-0.3	-5.3
Q	SELECTERM INC	7	5	4.50	+0.0	+0.0
N	U S LEASING INTL	55	42	49.25	+0.5	+1.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Wading boots

Alliant, Apollo mired; others swamped on Terrible Tuesday

Last week was not kind to the stock market, but two Massachusetts-based computer companies suffered more than most.

Alliant Computer Systems Corp., which had been one of the hottest initial public offerings in the past year, accelerated its recent stock decline at an alarming rate. On Wednesday, the minisupercomputer maker lost 25% of its market value, plunging 3½ points to 10½. For the first four trading days last week, Alliant was down 5⅛ points to a new low of 10⅛; it had traded as high as 37 since last November's public offering.

Investors reacted strongly to Apollo Computer, Inc.'s announcement late Wednesday that its third-quarter operating earnings would not be enough to offset a $5.7 million loss from an employee's unauthorized foreign currency trading [CW, Sept. 28]. Apollo stock dropped some 15% Thursday, losing 3¼ points to 17¾. For the four-day period, Apollo was off 4½ points.

IBM fell 5½ points during Tuesday's 91-point Dow Jones drop but was relatively stable the rest of the week, closing Thursday at 151½, down 3¾ points. Digital Equipment Corp. was off 4¼ points to 188.

CLINTON WILDER

Memorex counters IBM drive threat

Cuts prices, adds one-year warranty on drives and controller

BY STANLEY GIBSON
CW STAFF

MILPITAS, Calif. — Memorex Corp. will respond today to IBM's recent announcement of triple-density disk drives and channel speeds of 4.5M byte/sec. by cutting prices and adding a one-year warranty to its current disk drives and controllers.

In a briefing last week, Memorex also promised to boost performance in its current line later this year and said it will announce a new series of mainframe-class disk drives in the first quarter of 1988.

"Our price per megabyte and warranty is now exactly the same as IBM's," claimed Jack Scott, Memorex's vice-president of marketing, pointing to a per-megabyte price of $14.95.

"This response is not adequate to preserve Memorex's market share," said David Vellante, an analyst with International Data Corp. in Framingham, Mass. Although IBM plug-compatible vendors had been gaining market share against IBM, that trend will now reverse for some time, he said. "It's going to be a rough five years for them, no question about it," he added.

Last month, IBM announced triple-density drives, including the 1.26G-byte Model CJ2 integrated disk and controller unit, the 2.52G-byte Model J and the 7.5G-byte Model K. Each of the units uses a channel speed of 4.5M byte/sec. The new units boast faster seek times than IBM's comparable current 3380D and 3380E. IBM also announced one-year warranties on the new products.

IBM said its 3380J and 3380K disk drives will be available next month and current 3880 controllers may be upgraded to handle them.

However, a new 3990 controller, which will support several enhanced functions including a 256M-byte cache, will not be available until the third quarter of 1988. The CJ2 unit will be available at the same time as the 3990 controller in 1988, according to IBM.

Price rather than function

"For the next year or so, IBM's announcement is really pricing rather than function," Scott said, referring to the availability date of IBM's new controller.

Scott promised performance gains of 10% to 20% over current Memorex disks before Christmas. The improvements, which he said will be achieved through buffering and other methods, are intended to counter IBM's faster seek times offered on its new disk line. Scott declined to say whether Memorex would offer a 4.5M byte/sec. channel, however.

Scott said Memorex will offer next year a comprehensive set of products patterned after IBM's recently announced product series. He claimed that Memorex's disks, which would ship within a year of their announcement, would offer better price/performance than IBM's offerings. Memorex will offer a 256M-byte cache; furthermore, an integrated disk and a controller similar to IBM's CJ2 model is possible, Scott said.

Memorex cut the list price of the its 3682 double-capacity unit by 30%, from $98,140 to $70,000. A 3685 head-of-string unit, which includes the 3682 direct-access storage device (DASD) and a controller, was reduced from $122,480 to $85,000. Monthly maintenance prices were also cut by 24% and a 12-month warranty was added, Memorex said.

Disk drive prices cut

Memorex also cut its single-density 3680 disk drive prices from $32,220 to $29,500. A single-capacity 3683 head of string is now priced at $23,000. The Memorex 6240 high-density package was reduced 17% to $259,000 per string and a one-year warranty was added. Memorex's 3888 controller price was cut 15% to $51,000. The 3888-23 cache controller, which includes 8M bytes of cache, was cut 11% to $115,290.

Scott said the pricing and warranties, although not formally announced, have been in effect since the end of last month.

He said the line of storage products to be announced next year will be made by Unisys Corp., the manufacturer of Memorex's current line of mainframe-class DASDs.

User, vendor voices unite against FCC charge plan

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Corporate telecommunications users and value-added network vendors have swamped the Federal Communications Commission with written comments lambasting the FCC's proposal to raise the local access charges paid by enhanced service providers.

The FCC proposal could raise the cost of dial-up connections to value-added networks by about $4.50 per hour and jeopardize the growth of the information services industry, with no discernible benefits, the critics said.

"In short, there would be no winners, only losers," said the Ad Hoc Telecommunications Users Committee in its filing to the FCC. Similar comments were made by such end-user organizations as the International Communications Association, the Tele-Communications Association and the Association for Systems Management.

Contrary to the old adage, "if it ain't broke, don't fix it," the commission is "laboring to fix something that is not in need of repair," the Electronic Mail Association said.

The lobbying blitz has been so intense at the FCC and the U.S. Congress's telecommunications subcommittees that the FCC will drop the controversial proposal, predicted George R. Dellinger, a telecommunications analyst for Washington Analysis Corp.

Last June, the FCC proposed to end the temporary exemption from interstate access charges currently enjoyed by enhanced service providers, including vendors of packet networks, electronic mail, remote computing and on-line information services. The FCC expressed concern that these vendors are not paying their fair share of the costs of local exchange access.

The practical effect of the FCC proposal would be to increase by about $4.50 per hour the cost of providing enhanced services via private lines with dial-up access. Some vendors have said they are likely to pass the higher costs through to end users, while others would have to absorb the costs.

Several regional Bell holding companies supported the FCC's goal — requiring all interstate users of the local network to pay the same access charges — but said the policy would be difficult to implement and should be phased in slowly.

The vendors most affected by the higher access fees have been Telenet Communications Corp.; Tymnet, McDonnell Douglas Network Systems Co.; GE Information Services, a division of General Electric Co.; and Compuserve, Inc. [CW, Aug. 17].

Vendors in the information services industry said the higher access charges would be devastating for the price-sensitive residential, institutional and small-business markets.

HP stitches

FROM PAGE 1

Remote Process Management software allows users to run part of an application on an HP 3000 and part on either a PC or an HP Vectra personal computer, the vendor claimed.

The applications must be written "so that part uses MS-DOS, and part can access HP 3000 data bases," HP said, referring to Microsoft Corp.'s MS-DOS. The software provides direct communication between the applications so that the user need not initiate contact with the minicomputer, according to Bernard Guidon, marketing manager of networking at HP.

Law firm interested

This feature sparked interest at Cadwalader, Wickersham and Taft, a New York law firm that is developing applications that run partly on PCs and partly on HP 3000 servers running HP's Officeshare. "Our aim is to decentralize CPU activity as much as possible, since we have about 300 PCs and the 3000 isn't exactly a heavy number-cruncher," Information Services Director Robert Tivey said.

HP's offering could facilitate existing links the firm provides between IBM PC and HP 3000 applications, Tivey said. "Right now, you can have several lawyers, all accessing the same litigation-support data base as a menu pick, and they don't know if the file is on the PC or the HP 3000," he said.

The firm is less interested in HP's support of Netbios "because we had some trouble with PC LAN software, and our multiuser applications are mostly on the mini now," Tivey said.

Opens the gate

Network File Transfer allows a PC application to transmit to a remote HP 3000 across HP Advancenet and across a gateway to a DEC VAX on Decnet, Guidon said. The gateway, an existing product, translates routing commands from one network environment to the other, he added. The software allows "not just file transfer but interactive sessions" to take place across a hybrid networking environment, Guidon said.

Both applications are offered at no extra cost as part of Officeshare. This is a family of HP 3000-based office automation software applications plus communications software that allows PCs to access the services and other resources on an HP minicomputer. The enhancements will be available in the first half of 1988, the vendor said.

The enhancements to Officeshare represent "a very significant advance for HP, allowing users and application developers to take advantage of a distributed network," said David Terrie, president of Newport Consulting in Scituate, Mass. The software "puts HP's handling of distributed applications on a par with what DEC does now, although HP does not have a cluster configuration or a naming system."

According to Terrie, IBM currently offers some distributed computing products "in several pieces," including Distributed Data Management and Systems Network Architecture Distributed Services. In the near future, HP should announce a naming system giving users transparent access to resources distributed across networked nodes, Terrie said, adding that "DEC has something close to a naming system with the Distributed Naming Service it announced at Decworld; IBM has none."

HP plans to introduce PU2.1 support for the HP 3000 "whenever IBM announces PU2.1 support for the 9370," so that HP minicomputers can take part in an IBM peer-to-peer network of departmental processors, Guidon said. No time frame was given for HP support of the IBM Token-Ring network.

Netbios support allows any application written for the IBM PC networking protocol to access files, peripherals and various office automation services on an HP 3000 running Officeshare, Guidon said. While IBM recently ceased directly selling or supporting Netbios, it "is still the de facto standard, with hundreds of applications written for it," Guidon said.

Other new products

HP also announced the following products:

- The HP 10M bit/sec. LAN Bridge, a local-area network product which provides a connection between two coaxial 10M bit/sec. HP Ethernet backbones. Priced at $8,000, the bridge is available now.
- The HP-UX SNA 3770 product provides batch-file transfer betwen HP UX systems and IBM mainframes. Priced at between $2,000 and $13,000, it will reportedly be available in the first half of 1988.
- HP Network Services/Release 2.0 for the VAX allows HP 9000 systems to communicate with DEC computers using Telenet, a virtual terminal application written for Transmission Control Protocol/Internet Protocol. The release is set to be available in the first quarter of 1988 and to be priced at $6,120 for the DEC Microvax; $8,670 for the VAX 11/725 through 8500-family models; and $11,200 for the 8600 through the 8900 family.

HP UX systems are now certified to run over Network Systems Corp.'s Hyperchannel, a 50M bit/sec. channel-based network. Through Network Systems' Netex software, HP UX systems can communicate with any other host running Netex.

IBM replaces Rolm CBX with modular line

Controller-based systems obsolete older models; no upgrade, but trade-in discount offered to users

BY ALAN ALPER
CW STAFF

NEW YORK — IBM last week replaced the CBX, or computerized branch exchange, series of private branch exchanges (PBX) developed by its Rolm Corp. division with its first systems to offer built-in compatibility with standard telecommunications links, including Integrated Services Digital Network.

The 9750 and 8750 Business Communications Systems (BCS) replace Rolm's Model 8000 and 9000 family of PBXs, which will be taken out of active marketing Nov. 1, according to Jack Blumenstein, assistant group executive of telecommunications marketing and service.

The BCSs are said to support from 100 to 20,000 voice and data lines.

Takes up 70% less space

The 9750, which will be marketed in the U.S. and other countries except Europe, is said to require 70% less space and have lower power-consumption and air-conditioning requirements than older models.

The system is capable of handling about 70% more voice/data traffic than previous Rolm CBX systems using the Rolmbus 295E, the firm noted. The 8750 BCS was designed for the European market.

The 9750, designed around the 9751 voice/data controller, features a modular architecture said to enable users to upgrade capacity from 100- to 20,000-line capability. It uses the same 9000AE processor used with the CBX II 9000, which was introduced in July.

While the new models run the same operating software and applications as previous models, users cannot upgrade older Models 8000 and 9000 hardware to achieve the higher performance of the 9750.

Analysts last week gave the BCS high marks, but were unsure of the inroads it would enable the firm to make against perennial PBX leaders AT&T and Northern Telecom, Inc.

"The modularity — ability to upgrade as requirements increase — shows that it is a well thought-out and planned system," said Steve Zamieroski, an analyst with International Data Corp. in Framingham, Mass.

The standardization of IBM-Rolm architecture arrived too late for at least one Fortune 100 company. The firm bought a CBX several years ago, then discarded it primarily because of difficulties integrating the CBX's proprietary architecture into an existing network of Northern Telecom and AT&T PBXs.

"Rolm invited me to an executive presentation [of the new CBX], but I told them they'd already had a chance with us," according to the company's manager of network planning, who asked not to be identified.

Another sore point for communications managers is the low quality of support and service they have received from Rolm, particularly since IBM took over.

"A lot of telecommunications guys I've talked to feel that IBM ruined Rolm," the manager said. "Things have gotten a lot worse since they kicked out the Rolm service and support people."

The BCS series marks the first time that Rolm products are being marketed under IBM nomenclature since Rolm was acquired three years ago.

"It's clear IBM has taken over the direction in marketing and is folding Rolm completely into IBM as a subset of it's product offerings," said Fritz Ringling, an analyst with Booz, Allen & Hamilton, Inc. in Bethesda, Md.

One to five cabinets compose a CBX node, and up to 15 nodes can be connected to form a single system. Up to 2,000 lines can be supported in a single node system, IBM said.

The CBXs offer new error-detection isolation and correction, remote diagnostics and optional fault tolerance, IBM said. The CBX runs a new release of Rolm's operating software — 9004.3 — to support new voice/data applications introduced last week.

The new applications include an enhancement to the switches' automatic call-distribution capability that is said to enable users to track system performance and operating expenses.

Four models available

The 9751 is available in four models, ranging from the Model 20 with 100 to 720 voice/data lines to the redundant, multi-node Model 70, which is able to support up to 20,000 lines.

The Model 70 will be available in March 1988, while other models will be available in November, according to IBM.

A 250-line Model 20 is phone-mail ready, offers route optimization and 16 Rolmphone 120Ds. It will cost $158,000. A 1,500-line Model 40 that is comparably equipped will list for $790,000, IBM said.

In a separate but related announcement, IBM also brought out an IBM Personal System/2-based Token-Ring network performance tracking system.

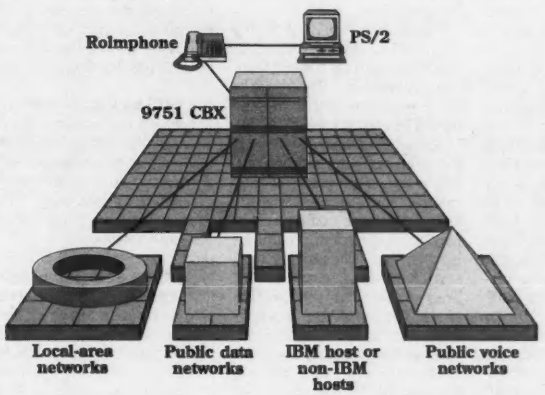
The system, including software and two adapter cards, is able to measure local-area network activity among up to 260 devices.

Available in the first quarter next year, IBM said the trace and performance software lists for $295 while two different types of adapters cost $1,195 and $1,295, respectively.

Senior Editor Elisabeth Horwitt contributed to this report.

Don't say Rolm

The IBM label goes on the latest CBX from its Rolm division; the 9751 supports from 100 to 20,000 voice and data lines



INFORMATION PROVIDED BY IBM

AT&T

FROM PAGE 1

won't futz around with [currently offered] Basic Rate services," said Thomas L. Nolle, president of Haddonfield, N.J.-based consulting firm Cimi.

While the Primary Rate defines 23 channels for high-speed communications between switches and hosts, the Basic Rate, which defines two 64K bit/sec. channels, is typically used to link user workstations to networking devices.

"Even if no other ISDN advance happens in our lifetime, we will at least have one benefit that we can see, feel and quantify," Jankowski said.

While TRW is evaluating the use of the Basic Rate Interface to connect user workstations, "the Basic Rate is not much use without the Primary Rate. One is the flint, the other the steel — you need both to make a spark," Jankowski commented.

Users and consultants have recently expressed concern about the extent to which ISDN will tack additional costs onto customer-premise equipment and carrier services.

This summer, AT&T announced a hardware and software upgrade that implemented two Primary Rate channels on the System/85 private branch exchange (PBX). The upgrade, which is scheduled to be available in December, is priced at $35,000. Other major PBX vendors have also announced Primary Rate upgrades for their products.

Passing cost to customer

A currently circulating industry figure has it that regional Bell holding companies will put ISDN access charges at 1.7 times the cost of current digital services. AT&T will have to pass some of those charges on to customers in order to provide local ISDN access, AT&T's Gagnon indicated. However, he added, "AT&T is not looking to say to a customer that already has T1, 'Well, now you're going to have to pay more for ISDN.' "

T1 users are likely to pay a basic fee for the vanilla Primary Rate service as well as additional costs depending on what additional services they order, "like fanning channels out" to different types of service, Gagnon said. He did not say whether AT&T will charge a flat fee or charge according to use for the optional services.

Jankowski expressed the hope that "the FCC will loosen up on the current ruling that AT&T must base charges for each tariff on projected demand and overhead for the individual service and let costs flow among different services."

In addition to the dynamic reallocation feature, AT&T plans to implement signaling schemes that will allow the caller's name and phone number to show up on the screen of the user device being called, Gagnon said. "This will be of significant value in telemarketing."

> "THE BASIC RATE is not much use without the Primary Rate. One is the flint, the other the steel — you need both to make a spark."
>
> KENNETH JANKOWSKI
> TRW, INC.

AT&T plans to follow a typical 12- to 16-month deployment cycle in its implementation of the Primary Rate service in different geographic areas, Gagnon said. Since Primary Rate services are currently unavailable through Bell operating companies, initial user access to the AT&T service will be through dedicated-line connections, he added.

In January, a number of European Postal Telephone and Telegraph companies are expected to follow AT&T in announcing Primary Rate Interfaces, industry sources said.

"I don't see a tidal wave of people launching orders for the Primary Rate service overnight, just because it's there," Gagnon said. "The significance here is that we have committed to the service. As people observe what benefits accrue to early customers, as we broaden access to more cities and vendors develop applications and features, it will catch on."

Users victorious in service wars

Reap greater options at lower cost as manufacturers, providers slug it out

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Competition between third-party providers and computer systems manufacturers for service customers has proven a benefit to end users, who are receiving the advantages of cheaper repair and a greater option of sources.

That was the conclusion drawn by both third-party service companies and systems manufacturers offering computer maintenance at a conference held for computer service companies last week. Sponsored by market research firm Frost & Sullivan, Inc., the two-day event focused on issues facing independent service providers.

"Large computer companies are realizing how important third-party maintenance is," said D. R. MacNaughton, project director for Frost & Sullivan and the conference chairman. "They are beginning to embrace it. It's not just captive — they're going after brand-new business in the old-fashioned way.

"They'll be a dominant force, if not the dominant force, in the service industry," MacNaughton added, noting that computer manufacturers NCR Corp., Unisys Corp., Digital Equipment Corp. and Honeywell Bull, Inc. will be among the top service providers nationally.

Independent service providers complained of the obstacles placed in their path by computer manufacturers not willing to cede service business to outsiders. Systems makers are making those parts necessary for computer repair more difficult to come by as well as significantly reducing maintenance fees for large customers.

Legal battles

Hewlett-Packard Co. has been the target of two lawsuits filed against it by independents charging that HP is attempting to squeeze them out of the market by reducing parts availability. HP has declined to comment on the charges.

However, litigation is not a desirable method to combat competition, said W. James MacNaughton, an attorney for Esquire, Schenck, Price, Smith and King. "The second to last thing they would want to do is sue HP," MacNaughton said. "The last thing they would want to do is have HP push them out of business. Small and medium-size companies don't get into lawsuits unless it's a life-or-death proposal."

Kenneth Cargill, director of service business for IBM, said IBM is committed to "maintaining a reasonable relationship" with third-party service providers. However, IBM is in the process of shutting the doors on a number of its parts centers located outside of major metropolitan areas.

Cargill said demand for the Personal System/2 line of microcomputers has strained IBM's parts supply for those products. "We are trying very hard to overcome this temporary problem," he said.

Clark Mandigo, president of Intelogic Trace, Inc., an independent service provider that was once a service division of Datapoint Corp., said the closure of those centers will delay parts delivery by one to two days to outlying areas. He added that his company will consider the costly proposition of stockpiling parts in warehouses.

"Manufacturers are trying very hard to eliminate competition for the service dollar," Mandigo maintained. "The result is it's lowered the cost to the end user. The end user wins."

Despite the financial clout of the large computer manufacturers, independents have said they can offer an advantage to the end user. With more end users employing multivendor solutions, independents can provide total service while manufacturers are likely to repair only their portion of the network. Also, independents said they offer special services such as computer leasing.

However, the final alternative may be, "If you can't beat 'em, join 'em."

"It's not coincidental that there have been so many acquisitions in the last couple of years as computer manufacturers have shown an interest in the service business," Frost & Sullivan's MacNaughton said.

Edelman hurls $870M takeover bid at Telex

BY CLINTON WILDER
CW STAFF

NEW YORK — Attempting to annex another claim for his stake in the computer industry, arbitrageur Asher B. Edelman last week announced a $65-per-share, $870 million hostile tender offer for terminals and peripherals maker Telex Corp.

Tulsa, Okla.-based Telex had not responded to the offer by late Friday afternoon.

Edelman, the chairman and principal owner of Datapoint Corp. and Intelogic Trace, Inc., is noted for acquiring companies, then selling or spinning them off as different businesses. After his takeover of Datapoint in 1985, Edelman spun off the maintenance unit of the minicomputer maker as independent firm Intelogic Trace.

Telex's core IBM-compatible terminals business has been struggling recently amidst high development costs and pricing pressure from competitors.

The potential combination of Telex and Intelogic Trace makes sense, according to Interstate Securities Corp. analyst Bob Grandhi. "Telex's product line is fairly low-tech, but over the years, the company has acquired strengths in maintenance and leasing," he said.

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INSIDE LINES

The more the merrier. Comdex/Fall '87 will definitely highlight the year of the 80386. Add Tandon and Unisys to the growing list of vendors that will unveil boxes at the Las Vegas show featuring the hot Intel chip. There will definitely be more names to add before Comdex opens Nov. 2.

Looking for a few good . . . IBM is said to be asking a chosen few software publishers to show applications running under OS/2 at Comdex, but it is unclear whether any have agreed to do so. One vendor that was contacted by IBM said, "We won't show our product until it is complete."

Play the short version. ETA Systems will reportedly use an Oct. 15 press conference in New York to introduce its long-awaited minisupercomputer, which many observers have code-named Piper. ETA, which announced its ETA-10 supercomputer earlier this year, is expected to offer an air-cooled, $1 million system providing about the same power as the CDC Cyber 205 super. ETA, which is a CDC subsidiary, declined comment on the speculation.

Still kicking — sort of. Despite speculation that Lotus's recent decision to drop copy protection was the kiss-off for The Networker, the network version of 1-2-3 and Symphony, one beta-test user said he received his last Networker upgrade this month. He described the most recent version as "fairly solid copy." The bad news, he said, is that the counter function is still present, despite the complaints of beta-test users.

Alpha, beta, later. Alpha Software will be showing off an unreleased integrated program at the Software Publishers Association meeting this week in Cambridge, Mass. The program is expected to compete against Microsoft's Works for the PC and Software Publishing's First Choice. The program is expected to be released in January. Alpha's first integrated program was Electric Desk, released in 1984.

They'll take it in trade. Hewlett-Packard is expected in November to offer a cash-back deal on HP 150 microcomputers, according to an MIS manager at one HP shop. This is evidently the vendor's response to irate customers who are sick of waiting for their special HP 150 versions of the latest MS-DOS software. HP's timely trade-in offer should bring joy to those customers who have been dying to switch over to the fully MS-DOS-compatible HP Vectra but couldn't cost-justify the move until now, the manager said.

The power of 1. Unisys will merge the fourth-generation language development efforts of the former Sperry and Burroughs under one program general manager, Hugo A. Simpson. "The appointment of a single senior manager to oversee what has been an expanding marketing and product development effort reflects a further increase in our commitment to the 4GL program," Unisys CEO W. Michael Blumenthal said in a recent statement. Unisys says there are 2,000 mainframe installations of Linc, which had been a Burroughs product, and 2,500 installations of Mapper, which had been a Sperry product.

Sitting by the dock of the bay. NAS reportedly has a backlog of mainframe orders that has forced the firm to call Tokyo and ask hardware supplier Hitachi for more. Usually, Hitachi computers are shipped over water to San Francisco. But lately, some machines have been air-freighted to meet customers' planned installation dates, sources said.

Heading out. Among the vendors taking to the road this month with new products are Excelan and Sun Microsystems subsidiary Tops (formerly Centram Systems West). Excelan is said to have at least three products in the bag, including Apple-compatible TCP/IP software, which is rumored to be the subject of an OEM contract between the two vendors, and support for the Open Systems Interconnect model. Tops is readying an Oct. 20 announcement in New York with graphics card maker Hercules Computer Technology: graphics for the network, maybe? A little less open is Apple, which not only has a token-ring card in the works but has also reportedly signed up a network software vendor to supply a Mac-only token-ring implementation.

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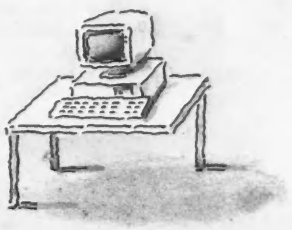

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